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The Personnel Journal

DEVOTED TO INDUSTRIAL PSYCHOLOGY
The Science of Work, the Human Factor in Management and the Satisfactory Adjustment of Individuals to Their Occupations

Is Industrial Psychology Making the Most of the Depression? —*Rex B. Hersey*
Some Attributes of Superior Students —*H. H. Remmers*
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Base Rates *vs.* Bonus Payments in Wage Comparisons for Standard Machine-tool Occupations —*H. LaRue Frain*
A Multiple Factor Study of Vocational Interests —*L. L. Thurstone*
News Notes Personnel Books Current Periodicals

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The Personnel Journal

THE PERSONNEL JOURNAL publishes original investigations in the applied sciences that contribute to knowledge and effective direction of people at work.

THE PERSONNEL JOURNAL is published for the Personnel Research Federation whose object is "the furtherance of research activities pertaining to personnel in industry, commerce, education, government, and other fields, wherever such researches are conducted in the spirit and with the methods of science."

THE PERSONNEL JOURNAL renders a service not only in centralizing information about personnel research, but also furnishes a continuous accumulation of authoritative material in this field. Significant contributions by specialists in the biological and medical sciences, psychologists, psychiatrists, engineers, and economists, have been published.

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Is Industrial Psychology Making the Most of the Depression?

By Rex B. Hersey, *Industrial Research Department, University of Pennsylvania*

This stimulating paper on the need for definite research planning, in order that business management and social science may learn the valuable lessons an industrial depression can teach, was written by Professor Hersey after attending a Conference on the Effects of Part-Time and Layoff,[1] *held under joint auspices of the Personnel Research Federation and the Social Science Research Council.*

"Sweet are the uses of adversity;
Which, like the toad, ugly and venomous,
Wears yet a precious jewel in his head."
—As You Like It,
Act II, Scene I.

THE economic depression from which the world has been suffering for the past two years will not continue in its present virulent form forever. The outlook for the future, however, is not particularly bright. Even granted that the moratorium initiated by President Hoover does bring into the present economic situation a ray of hope that market conditions all over the world may be somewhat improved, American industry is faced with a long-run problem of absorbing a surplus supply of workers. There is a lack of balance between production and distribution which will not be entirely corrected at once. In view of that fact, a conscientious analysis of the research problems arising out of this situation and possible methods of attacking them may not be amiss. What unique opportunities does this depression present for gaining new light on the feelings, attitudes and efficiency of workers as affected by their experiences with part-time, lay off, and various other methods adopted by industry when confronted by the need of reducing output?

While the main emphasis of this article will be upon those research opportunities which the present depression offers in regard to workers, the employers are both the "alpha" and the "omega" of these opportunities. They are the "alpha" in that they or their representatives decide who should be fired and who should be retained. They are the "omega" in that sooner or later the cost of their method of handling their working force

[1] The full report of this conference, in mimeographed form, may be consulted in social science libraries, or obtained on loan from the Social Science Research Council, 230 Park Avenue, New York, or the Personnel Research Federation, 29 West Thirty-ninth Street, New York.

is placed upon the firm's balance sheet. The first problem, then, upon which we need enlightenment is the question of how best to curtail the working force during a depression. The specific questions which should be answered for the employer, as well as the psychologist, in regard to this major problem are:

"Is a temporary curtailment of working hours better than the layoff of a part of the employees?"
"If temporary curtailment is decided upon, is the result more profitable if short time is made the rule for all employees, or if a rotation of workers for certain days of the week is utilized?"
"If, on the other hand, it is decided to dismiss or lay off a percentage of the force, what machinery and what methods are to be used in order that the morale of those remaining on the job may be kept up?"
"Should the workers dismissed have long or short notice?"
"What is the effect of a dismissal wage and do the workers immediately seek other employment, or do they tend to wait until the money they have available is practically exhausted?"
"Should the workers have a share in determining who shall be fired and who retained?"

No adequate estimate has as yet been made of the psychological effects on the workers of the various solutions which firms have adopted in regard to such questions as these. It is very doubtful if the employer realizes that the technique which he works out to meet the necessity for reduced output may have many reverberations not only upon his own workers but ultimately upon the peaceful and cooperative course of industrial relations in the United States.

The second major question has reference to the methods of building up or re-establishing the working force as conditions improve. What can be learned during the depression which will help employers, psychologists, labor exchanges and other agencies to bring about better adjustments of workers and jobs?

"What lessons do the experiences of workers with various efforts to provide a livelihood during the depression teach as to methods and types of retraining necessary for rehabilitation or re-employment at new occupations?"
"Can more generally useful and standardized job descriptions be prepared, as a basis for the more advantageous placement of workers and a means of forecasting personnel requirements?"
"How can employment exchanges best study the individual applicants and advise them as to opportunities for specialized training in line with probable future demand as well as in line with their individual talents and interests?"
"What changes in demand for specific sorts of labor can be anticipated?"

These questions concern primarily the employer and employee. Other questions in the same category are of more vital interest to the psychologist and economist. For instance:

"What groups of workers have felt the depression least, as regards security of the job?"
"Is there a distinct difference in the effects of the depression on the various racial groups?"
"Is it easier for women and children to get employment than for men, because of the lower wage paid them?"
"What are the actual processes through which the mind of the individual employer goes in attempting to solve the various problems incidental to the

correct treatment of his labor force during a depression?"

"After lay-off does the most efficient man get the job back?"

"Does a radical reduction in working time offer the best solution of the existing state of chronic unemployment due to technological advances or would it defeat its own end through increased individual production or in other ways?"

"What is the effect of differences in age, degree of skill, etc., in relation to changes in hours?"

"What improvements are necessary in the labor market machinery beyond the mere establishing of public employment offices, with or without advisory committee?"

The answers to most of these questions are not easy or direct. They must be sought in many phases of human activity. Possibly a description of the chief sources of information, with suggestions of major problems may be helpful.

On the whole, the workers are at the present time divided into three main groups:

(a) those employed on what might be called a normal schedule,
(b) those on part time, and (c) those unemployed.

The unemployed may be further subdivided into those who are being partly or wholly carried by relief agencies, either as straight relief cases or through the instrument of made work, and those able to look after themselves through the use of savings or through the fact that other members of the family may be working. The chief research opportunity would seem to lie in a comparison of the reactions of these three major groups

Regarding each of these classes of workers many kinds of data are desired, as indicated in the accompanying chart. The task of the investigator is to find out how these data are related, or how they are affected as the status of the worker is changed by lay off, part time or re-employment.

As one looks over the foregoing list of problems, he is bound to be struck with their number and intricacy. It is to be devoutly hoped, however, that he will not throw up his hands in disapproval and say, "What is the use of bothering with all that list. The little bit I may be able to do in my plant or my area of research will not help." The truth is that only through the cooperative endeavors of many employers and research workers in different parts of the country can sufficient reliable information be obtained to enable us to learn both the good and bad features of the unemployment situation. This is the task of not one but of many research agencies.

The problems outlined are moreover not all-inclusive. They are linked together in devious ways and their possible effects on the mental health of the individual worker and on the future growth of our industrial society may create problems that cannot even be surmised at the present time.

Having, however, stated the more obvious questions in definite terms, let us see what approaches to their answer may be suggested by the various sciences involved. After that I shall endeavor to outline briefly some of the work that is being or has been done.

The first item on which information is sought is that of plant behavior. Many plants keep a rough estimate of the production of individual workers

OUTLINE OF POSSIBLE RESEARCH DATA ARISING OUT OF THE DEPRESSION

FULL TIME WORKERS	PART TIME WORKERS	UNEMPLOYED
Objective Plant Behavior Production Accidents Outbursts Turnover	Objective Plant Behavior Production Accidents Outbursts Turnover	Plant Behavior Whatever data available where worker was previously employed
Health Number and nature of illnesses Dispensary visits Physiological tests Time Lost	Health Number and nature of illnesses Dispensary visits Physiological tests Time Lost	Health Nature and number of illnesses Physiological tests
Personnel Data Age Schooling Previous experience Trade training Scores in Intelligence tests Trade tests Tests of emotional balance	Personnel Data Age Schooling Previous experience Trade training Scores in Intelligence tests Trade tests Tests of emotional balance	Personnel Data Age Schooling Previous experience Trade training Scores in Intelligence Tests Trade tests Tests of emotional balance
Attitudes toward Racial prejudice Political and Social theories Standards of moral and legal behavior	Attitudes toward Racial prejudice Political and Social theories Standards of moral and legal behavior	Attitudes toward Racial prejudice Political and Social theories Standards of moral and legal behavior
Savings	Savings	
	Standard of living General effect on manner and place of living Family ties Nature of curtailment of purchases	Standard of living General effect on manner and place of living Family ties Nature of curtailment of purchases Use of savings
	Use of leisure time	Use of leisure time
		Depression and unemployability
		Labor Mobility—Securing Jobs Local Plant to Plant Industry to Industry Intercommunity City to City
		Creating Livelihood Economic self-sufficiency vs helplessness in the individual
		Trend to crime

or gangs. However, if the figures on production are to be of value they must be of such a nature that a production curve in hourly units can be plotted. They must also eliminate or describe those conditions outside the worker himself which may be chiefly responsible for variations. Otherwise, it would be impossible to compare results in plants, where different techniques have been utilized to meet the curtailment of the working force.

There is a widespread feeling that employees produce more in a depression when they feel their jobs are not so secure. No one can formulate an authoritative answer. The keeping of accurate production records in many firms, coupled with careful descriptions of the conditions involved—to be sent in later to the Personnel Research Federation for evaluation and analysis—would enable us to answer this question with some certainty. Unless careful plant records are kept at this time we may also miss many valuable opportunities to weigh the relative merits of the five-day week, the six-hour day and other controversial questions of working time. Any other items, such as accidents, labor turnover, etc. which can be stated in comparable statistical terms and which give evidence of the relative efficiency and morale of the employees as they work under the conditions of the depression are bound to throw light on the important problem of human nature in industry. Many plants are keeping those records today and might be willing to make them available, if they realized their value.

The same statement may be made concerning the health records of the workers. Slight changes in the records or a little more care in probing into the individual cases may give us invaluable light as to why the death rate is lower in a depression than in years of greatest prosperity.[2] Here again, care in writing up all the conditions is necessary. For instance a big increase in the number of dispensary visits in a plant working part-time as contrasted with its previous record when on full time might mean that the workers did not have the money to visit their own doctors rather than a decrease in health.

These remarks in regard to objective plant behavior and health indicate clearly the need for the keeping of records over a long period, with a description of accompanying changes. The figures on labor turnover might furnish the most obvious example of this need. During the depression, turnover in Plants A and B, two comparable plants in the same industry, may be 5 per cent. After the depression lifts and more jobs become available, the turnover in Plant A during the succeeding year may be 25 per cent, while that in Plant B may rise to 60 per cent. Records kept merely during the depression would not bring out this difference or the causes.

If we go further into the analysis of the individual worker at the present time, it would seem necessary to arrange for a more specialized research machinery which would necessitate one or more trained investigators taken from the plant, a near-by university or a research agency.

[2] Ogburn.

Such problems as morale, attitudes, effect of variations in the standard of living, and the use of leisure time need to be attacked in a thorough and painstaking way if they are to yield data of scientific value. And perhaps it is too much to expect the employers to concern themselves with the assembling of such information, even though in the long run it may be of great use to them. It may be that we must look to other sources for funds to carry on these more searching studies, provided the employer furnish the laboratory wherein the study of those who remain on the job and those who return to work may be conducted. The actual research must be done mainly by the economist, the psychologist, and the sociologist.

But even they face a choice of methods. They may choose the individual approach and endeavor to get information on all questions mentioned. In so doing any investigator would be forced to limit the size of his group. If, however, he chose and defined a limited problem, he could include many more people. If, for instance, under Labor Mobility, he wanted to find out the extent to which the depression is tending to send the negroes back from the North to the South, he might be able to conduct his study on the basis of statistics available without interviewing a single person. There is thus no one best method. The choice of method depends upon the individual investigator and the opportunities at his disposal. Between the wide limits of the individual approach and the purely statistical or economic lie many combinations of the two.

The actual information may be obtained in many ways. The keeping of plant records has already been mentioned. Interviews and observation at continuing intervals are necessary to acquire much of the information regarding standard of living, use of leisure time, and savings. The measurement of attitudes may be done roughly by the use of questionnaries or possibly with fair accuracy by the use of attitude scales like those of Thurstone. Even here frequent interviews and observation cannot be entirely dispensed with. Indeed the most vital point in every research tending to ascertain what is happening to the worker when unemployed, as contrasted with his reactions when employed, would seem to be the necessity and difficulty of keeping in touch with him over a long run period.

It is this problem which makes it so important for the relief agencies to obtain all the information possible while the unemployed are under their jurisdiction. How many relief agencies, however, have obtained a history of the industrial records of the unemployed between appeals for aid? Do the agencies attempt to portray their efforts to secure a job or to create a livelihood in order not to be forced to fall back on charity? What valid information based on verified case histories can they give as to the rôle played by unemployment in producing unemployability. The agencies are perhaps not to blame. Their function is to help the needy and they perform it well, but what a store of information would be available, if only a little more time and cooperative organization had been utilized! How-

ever, I am not condemning for the past; I am pleading for the future.

If, however, we are to get information on all the questions listed, as they concern the individual in their entirety, we must have *case studies followed by long-run histories of individual changes up and down the economic scale or full case records of the agencies correlated with industrial employment histories, including objective plant records.* As many tests, both physiological and psychological, as is possible to administer, should be given at intervals to check on the results of observation and interview. Enough workers of similar grade, who remained steadily employed, should be included to serve as a control group. Even transfer from one job to another might cause a let-down in efficiency that would be comparable to unemployment. Such studies, to be most worthwhile, should analyze both the entire industrial setting of the individual and his relations outside the plant rather than give exclusive attention to the factor of layoff. In this way only can we get accurate data on the effect of unemployment on the individual's objective plant behavior, attitudes, manner of life, health, use of leisure time, mobility, economic self-sufficiency, criminal tendencies and unemployability,—in other words his mental and emotional health in relation to the industrial society in which he lives. A hopeless task? No! A difficult but intriguing one!

A possibility of such a study in less intensive form exists in Philadelphia. The Philadelphia relief group is an exception to most relief centers and has personal history records on some twenty-one thousand unemployed who were engaged in "made" work. Special work histories were obtained on some 9000 of these and their families; these are now being analyzed with a view to determining the type of unemployed who were engaged in "made" work. Though similar data are not being collected in other emergency centers, this will provide a reservoir of data having more consequence in the future than now. The problem is to analyze these data. Perhaps a large-scale study could be made of fifteen hundred of these workers, in which interviewers would go back to the last job of the man, get all the information possible from the employer to show what sort of employee this individual had been, why he was laid off, etc. This picture could be contrasted with the data on the relief record; and these cases followed up as the workers became re-established in industry or failed to become so re-established. Such a follow-up study would throw light on the problem in particular of the extent to which layoff in time of depression is likely to produce chronic unemployment during a succeeding period of prosperity. And of course if such a study were made there would likely be opportunities for measuring attitudes toward previous work, present situation and the new work into which the individual goes.

Another study might be made some years later. After allowing for a period of reabsorption into industry, 500 workers might be selected who have received aid from the Philadelphia social agencies, and 500 chosen at random in the city directory, and the two samples compared. The possibilities

for research into human nature and industry are more numerous now than ever. In fact many worthwhile studies on various phases of this problem to which one can call attention have already been completed or are now in progress.

The study which Clague and Couper made of the readjustment of workers displaced by the shutdown of the New Haven Plant of the United States Rubber Company provides enlightening material (1).

Case material collected by the National Federation of Settlements and edited by Marion Elderton shows very clearly the detrimental social and economic aspects of long-continued unemployment (2).

Other interesting articles and reports looking to the control of the situation are listed in the references at the end of this article.

Studies now in progress to provide more light on some of the problems discussed in this article are:

Kornhauser's investigation of the effect of managerial functions on the objective plant behavior and attitudes of workers for the Kimberly-Clark Corporation.

The study of the Industrial Research Department of the University of Pennsylvania which involves, among others, the following aspects of the unemployment situation:

Current measurement of amount of unemployment.
Studies of the nature of the stabilization problem in particular industries.
The problem of public work based upon an analysis of ten years' public construction in Philadelphia.
Means of finding jobs in a particular industry.
Trends in savings in prosperity and depression.

Two most interesting efforts to combine research and control are the Rochester and Minnesota experiments.

In Rochester the industries are endeavoring by collective effort not only to make it possible for the workers to find jobs readily through a joint employment agency but to go further and analyze the jobs in the different plants and industries in such a way that a job analysis will mean something outside the plant in which it was made. In that way the social or community interests may be served by putting the worker who can do several jobs equally well on that particular one which other workers may not do so well rather than give the job to the first worker who can do it, regardless of other work he might do much better.

The Minnesota work is also impressive. Here personnel studies have been carried on for five years under William Stead of the University of Minnesota, in close coöperation with industry. These studies in general show an increasing population in that center with no appreciable increase in payroll jobs in the last five years. In other words, jobs are stationary and the population is increasing. That is not an emergency, but a long-time problem, not merely due to the depression of '30–'31. The school age is going up. Relatively fewer men over forty-five are being employed. There is a constantly narrowing age margin of employment in the population. But these measure do not solve the problem. What can be done?

There are three phases of the Minne-

sota research program. First, the committee on economic background hopes to study intensively five hundred firms, selecting those which have contributed most to the situation—analyzing cost figures, production figures, and so forth. This economic background work will be supplemented by case studies of the work histories and earnings of a sample of four thousand workers. The chief purpose of this work will be to determine the industries where the need for workers in the future will increase, remain stationary or decrease. The second committee is that on individual diagnosis and re-training. . . . . The individuals will be subjected to a complete physical examination—a really thorough examination—and then a psychological examination. Diagnoses will be made, and individuals classified as unemployable or employable, i.e., capable of being rehabilitated as soon as work picks up. Rehabilitation may be necessary because of changes in industry or because the individual himself is maladjusted. The effort will be made to tie up diagnosis with placement on one hand and rehabilitation on the other. No retraining will be done on the basis of diagnosis alone, but also in terms of occupational trends. Training will be done for jobs in which employment is on the uptrend. The work is somewhat like that of the people who have been working on the rehabilitation of the crippled. The third committee is concerned with raising the standard of practice in the free employment bureaus.

While the Rochester and Minnesota experiments are still in the embryo stage, their possible importance for both social welfare in the community and the development of scientific knowledge regarding the nature of man and his work is so great that the effort must be highly praised.

While industrial psychology is not as yet making full use of the depression, it recognizes the challenge of the situation to the research worker, and is responding energetically. There is an awareness of the situation and its problems that promises well. Full advantage of the research opportunities presented by the depression cannot, however, be taken by the industrial psychologist working alone. The wholehearted and thoughtful cooperation of employers and social agencies is indispensable.

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Some Attributes of Superior Students*

By H. H. Remmers, *Purdue University*

Professor Remmers' group comparisons of high ranking students with those who have not distinguished themselves by superior scholarship, challenge some prevalent opinions, while providing statistical confirmation for others. The superior group contains, for example, more than its share of only sons, as well as a larger proportion not interested in athletic sports.

A group of 531 "distinguished" Purdue students, constituting approximately the upper six per cent of all students in scholarship, were compared by the method of group differences with a random sampling of 300 non-distinguished students. It was found that a student's chances of being distinguished are enhanced in varying amounts by the following factors:

(1) Having a high standing on entrance tests.
(2) Being in the Schools of Agriculture, Chemical Engineering, or Science.
(3) Being a junior or senior rather than a freshman or sophomore.
(4) Being younger than the modal age at entrance.
(5) Being slightly heavier than average.
(6) Being less interested in sports than the average student.
(7) Having a self-rating above average on the trait *native capacity*.
(8) Being rated above average on the Purdue Personnel Rating Scale.
(9) Being an only child or one of two children in the family.
(10) Coming from a large, long-term city high school.
(11) Having a father who is a professional man.
(12) Having no or few relatives graduating from Purdue University.

THE general problem of the present study was to find out in what measurable ways distinguished students differ from their non-distinguished fellow-students.

Since the academic year 1926–1927, Purdue University has published a so-called "distinguished student" list. Since 1928–1929 each distinguished student has been allowed a remission of fees in the sum of thirty-five dollars for each semester in which distinction is achieved. In 1929–1930 approximately the upper six per cent of the undergraduate students were on the list of distinguished students. They constitute, therefore, a highly selected group in terms of scholastic achievement, and are in the judgment of the Faculty the potential leaders of the next generation.

* This paper was read at the Annual Meeting of the American Psychological Association held in Iowa City, December 1930.

There is available in different offices in the University—Registrar, Dean of Men, Director of Personnel in Engineering, and Division of Educational Reference— a considerable amount of factual material. As much of this material as possible was brought together for all students who had appeared one or more times on the list of distinguished students for the years 1926–1927 to 1929–1930, inclusive. This gave a total of 531 students. In order to compare and contrast this group with non-distinguished students, a sampling of approximately 300 students who had failed to achieve distinction was drawn at random from the total student population in proportions equal to that of distinguished students in each class (i.e., freshman, sophomore, junior, and senior).

The totals given hereafter do not always tally with those just quoted, for rarely is each item of information found in the records for all students. Without question more striking group differences would have appeared had students on probation because of scholastic delinquencies or at least students below some defined degree of scholastic achievement been taken for comparison with distinguished students. It was decided, however, to take "mine run" students on the principle that any characteristics which significantly differentiated the distinguished students from these would be all the more meaningful for any administrative and educational implications involved.

TABLE 1

Comparison of percentage differences by schools for distinguished students and total enrollment (1926–1929)

	AGRICULTURE	CHEMICAL ENGINEERS	CIVIL ENGINEERS	ELECTRICAL ENGINEERS	MECHANICAL ENGINEERS	SCIENCE	HOME ECONOMICS	PHARMACY	INDUSTRIAL EDUCATION
Distinguished, N = 531	13.1	10.4	11.3	22.0	11.7	17.3	11.9	2.1	0.2
Total enrollment, N = 10,785	9.7	6.4	15.7	21.5	18.9	12.5	11.6	3.4	0.3
Difference	3.4	4.0	−4.4	0.5	−7.2	4.8	0.3	−1.3	−0.1
$\frac{\text{Diff}^*}{\text{P.E.}_{\text{diff}}}$	2.46	4.34	4.89	0.53	5.22	4.21	0.24	2.55	0.25

This table is to be read: Of the total of 531 distinguished students, 13.1 per cent were enrolled in the School of Agriculture, the total enrollment of which for the same period was 9.7 per cent of the total University enrollment.

* When this ratio is 3 or more, the difference between the percentage of distinguished students and total enrollment is statistically highly reliable, i.e., these differences have a probability of 99 in 100 of being real, and in the direction indicated.

DISTRIBUTION OF DISTINGUISHED STUDENTS ACCORDING TO SCHOOL OF UNIVERSITY

The proportions in which distinguished students were registered in the various schools of the University at the time of gaining distinction are shown in table 1.

For purposes of comparison the

proportion of the total enrollment of each school for the period covered in this study is also given. The schools of Agriculture, Chemical Engineering, and Science have furnished appreciably greater proportions of distinguished students than the expectance based upon their total populations. The percentages in the schools of Pharmacy and Industrial Education are perhaps too small to warrant any statistical generalizations.

The fact that the School of Chemical Engineering furnishes nearly two-thirds more distinguished students than would be expected in an undifferentiated sampling of all students in the University is easily accounted for, since the freshman placement tests have uniformly shown chemical engineering freshmen to be a very superior group as compared with other freshmen. It is more difficult, however, to account for the fact that the School of Agriculture has also furnished more distinguished students than its quota. It would seem that one of two things must be true: either standards of accomplishment vary from one school to another in such a manner as to bring about this difference, or students of agriculture are sufficiently better motivated to capitalize their intellectual endowment more thoroughly than other students. In a previous study it has been shown that on the whole pupils from a rural environment tend to work more nearly up to capacity as measured by tests.[1]

[1] See H. H. Remmers, *A Diagnostic and Remedial Study of Potentially and Actually Failing Students at Purdue University*, pp. 39–40 and 116–119.

The two alternatives offered for the agricultural students would seem to hold also for the School of Science, inasmuch as the proportion of distinguished students in this school is approximately 40 per cent greater than the expectancy.

It is of interest also to note that the Schools of Civil and Mechanical Engineering furnish a significantly smaller proportion of distinguished students than would be expected, especially since the freshmen in these two schools have been shown by the freshman placement tests to be on the average a representative sampling of the engineering schools as a whole. The observed differences must again be due to differences in standards of marking or in student motivation, or to both.

TABLE 2

Percentage of distinguished students in each of the four undergraduate classes, 1926–1929

	FRESHMEN	SOPHOMORES	JUNIORS	SENIORS
Distinguished students (N = 531)	13.4	16.2	39.5	30.9
Total enrollment (N = 10,785)	40.0	27.9	17.8	14.3

ENROLLMENT IN THE FOUR UNDERGRADUATE CLASSES

That scholastic distinction is a function of the class in which the student is enrolled appears clearly in table 2. It is worthy of note that practically two-fifths of all distinguished students are juniors, while juniors and seniors together constitute more than 70 per

cent of distinguished students, although the total proportion of these two classes in the University is less than one-third.

AGE AT ENTRANCE

The age at which students enter the University bears some rather significant relations to the achievement of scholastic distinction. While the average age at entrance is almost exactly the same for both groups, i.e., almost exactly nineteen, the distinguished students are much less frequently "typical" in that they are more often either older or younger than their non-distinguished classmates. The greater frequency of young distinguished students is especially noteworthy. More than one-fourth of them (26.8 per cent) are seventeen or younger, while only 9 per cent of the non-distinguished group are at or below this age. Of the distinguished students 59.2 per cent are 18 years old or younger, while for the non-distinguished students this proportion is only 49.3 per cent. Apparently it is true not only that the early bird catches the worm, but that these early birds are better equipped to digest the worm properly, since in general students with superior scholarship drop out of college much less frequently than do other students. If 18 years is considered the normal age at entrance, there are fewer of the distinguished students "at age." The proportions are 34.2 per cent for the distinguished and 40.3 per cent for the non-distinguished students.

There is little doubt that this greater variability of distinguished students would be increased were it not for the tendency to keep students who are "too young" out of the University. Parents and school administrators tend to urge students who complete their high school work a year or two or even three or four earlier than the average to wait a corresponding length of time before entering college. Whether this is sound from the standpoint of the students' adequate social and emotional adjustment is an open question. It is certainly *not* sound insofar as the students' ability to carry college work is concerned.

HEIGHT AND WEIGHT

Information concerning height and weight of entering freshmen is collected and filed in the office of the Dean of Men. Tabulation of the figures on height showed no significant differences.

The distinguished students however, were on the average 6 pounds, or a little more than 4 per cent, heavier than the non-distinguished students. So far as average weight may be taken as an index of physical robustness, distinguished students would appear to have on the average an advantage in this respect. It is of interest to note that this finding is supported by Terman's data on younger students in his *Genetic Studies of Genius*, Volume I. In a study of 643 gifted children whose intelligence quotients were all above 140, Baldwin reported that "the gifted California children as a group are above the best standards for American born children in physical growth status for average standing height and weight. They also excel in average standing height and weight other groups of California children studied by Barnes, Boas, and Faber." With our sampling

of something over 800 students, the findings just cited make it strongly probable that the observed difference is significant.

ENTRANCE PLACEMENT TESTS

All freshmen at Purdue University are required to take a series of entrance tests, a psychological, a mathematics training, an English, and a chemistry aptitude test. Of all the characteristics on the basis of which these two groups were compared, these test scores showed the most striking differences. When all scores were reduced to percentiles, distinguished students were found to average approximately 80, the average for the entire freshman class being 50. This superiority of distinguished students is quite uniform, no matter which of the tests is considered. Approximately 47 per cent of distinguished students have a percentile score of 90 or more, as compared with 10 per cent for the freshman class as a whole. Only 9 per cent of distinguished students are below the average (50th percentile) as compared with 50 per cent for the undifferentiated freshmen.

Given a distinguished student with a relatively high psychological examination score, is he more likely to achieve distinction in successive semesters than if his score, though above average, is relatively lower? To answer this question, an "efficiency index" was computed for each distinguished student by dividing the number of semesters during which he achieved distinction by the total number of semesters he had been in the University. This gave a percentage rating with a possible maximum of 100.

Those who had been on the distinguished list during at least half their time in the University had an average percentile score of 86.0, while those who achieved distinction for less than half their time in the University obtained an average of 75.7. This difference of a little more than ten points on the scale is statistically highly reliable. Even within this highly restricted and selected group there is a very definite tendency for a high "efficiency index" to go with a high psychological examination score, and *vice versa*.

FRESHMAN SELF-RATINGS AND RATINGS OF FRESHMEN AND JUNIORS BY FACULTY AND FELLOW STUDENTS

Before being permitted to matriculate in the University each freshman is required to furnish among other personal date a self-rating on ten traits as given in figure 1.

In the schools of engineering the same rating scale is used to obtain for each student a rating from five teachers and five students, the rating scale being changed only in that third person pronouns are substituted for first person pronouns. These ratings are obtained twice during the student's career—once during his freshman year and again in the junior year.

The rather elaborate tabulations made must be omitted here. Space will allow presentation of only the more significant interpretations.

Except in the trait *native capacity* prospective distinguished students do not rate themselves higher than do non-distinguished students. Since for this trait these students have had more unexceptionable objective evidence on

CHARACTERISTICS	POOR		LOW		AVERAGE		HIGH		HIGHEST		
	1	2	3	4	5	6	7	8	9	10	
1. ADDRESS AND MANNER: (Do I leave a good impression? Do I talk well? Am I popular? Have I a good bearing?)											
2. ATTITUDE: (Am I rational, agreeable to reason, in my views? Interested in my work? Optimistic? Self-controlled?)											
3. CHARACTER: (Am I reliable? Dependable? Absolutely honest? Responsible? Clean? Just? Courageous?)											
4. COOPERATIVE ABILITY: (Can I work with others? Am I accommodating? Loyal? Willing to learn? Tolerant? Tactful? Am I a good mixer?)											
5. DISPOSITION: (Am I cheerful? Courteous? Congenial? Enthusiastic and not conceited?)											
6. INDUSTRY: (Am I a hard worker? Have I perseverance? Am I persistent?)											
7. INITIATIVE: (Am I a self-starter? Do I recognize, start and develop opportunities to a successful conclusion? Am I original?)											
8. JUDGMENT: (Have I common sense? Observing and reasoning power? Foresight? Resourcefulness? Do I know values and the relations of things? Am I practical?)											
9. LEADERSHIP: (Do I understand men and can I command their respect? Have I executive ability? Do I precede and direct men?)											
10. NATIVE CAPACITY: (Am I naturally accurate, systematic, bright, alert? Have I an inherent knowledge of facts and data? Can I concentrate? Do I learn readily? Have I a natural aptitude for work?)											

Remarks: Indicate under this head any additional information which may prove of value. If you have poor health, a deformity, or any peculiarity this should be reported. Please note here.

FIG. 1. SELF-RATING BLANK

themselves than for probably any other trait, it is of interest to reflect that one's self-evaluation is probably largely a mirroring of the evaluation placed upon us by others.

Faculty and fellow students rate the distinguished students much higher than they do non-distinguished students and also much higher than distinguished students rate themselves. On the other hand, non-distinguished students are rated about as they rate themselves.

his hobbies, doubtless on the theory that a student's hobbies may indicate something concerning his life interests which could serve as a basis for educational and vocational counsel. In looking over the blanks as filled out by these prospective students, one wishes that the notion of hobbies were more clearly defined. In the student's mind it includes everything from the most trivial and inconsequential sort of activity or lack of it to the most difficult and exacting mental effort, school

TABLE 3

Kind and number of hobbies reported by distinguished and non-distinguished students

KIND OF HOBBIES	DISTINGUISHED		NON-DISTINGUISHED		PERCENTAGE DIFFERENCE	Diff / P.E.diff
	Number	Percentage	Number	Percentage		
Intellectual	83	16.0	55	13.8	2.2	1.35
Sports	108	20.8	114	28.6	7.8	3.79
Outdoor activity other than sports	17	3.3	12	3.0	0.3	0.38
Mechanical—manipulative	110	21.2	64	16.0	5.2	2.83
Amusements	27	5.2	21	5.3	0.1	0.10
Intellectual—Mechanical	44	8.4	24	6.0	2.4	1.98
Music	44	8.4	26	6.5	1.9	1.49
None	87	16.7	83	20.8	4.1	2.30
Total	520	100.0	399	100.0		

As between freshmen and juniors, it may be said that while juniors are rated *relatively* the same as freshmen, the absolute values are considerably higher for juniors. That is, average ratings on specific traits shift upward for juniors, but they are relatively high in the same traits in which freshmen are high. This holds for both distinguished and non-distinguished students.

HOBBIES

Among many other things the prospective freshman is asked to indicate

subjects included. Taking the reports as they stood and grouping them somewhat arbitrarily, they were tabulated as indicated in table 3. There are no noteworthy differences here, except in the matter of sports, in which non-distinguished students show a significantly greater interest than do the distinguished students. This corroborates to a slight extent the view that the superior student is less given to enthusiasm about college sports than his non-distinguished classmates.[2]

[2] [It may, however, be noted that the following differences, although no one of

A tabulation of the number of hobbies reported—since many students report two or more—shows no significant differences in this regard for the two groups.

PROPORTION OF EXPENSES EXPECTED TO BE EARNED WHILE IN COLLEGE

It has been rather generally assumed that the student who works his way through college is likely, other things equal, to be a somewhat better college risk than those who are financed by parents or others. If the student's expectation in the matter before he comes to the University is an index of what he does after arriving, it must be concluded that this factor makes no difference. This finding is in accord with the very extensive study "Success in College and Business" reported by D. S. Bridgman in the PERSONNEL JOURNAL for June, 1930, a study of several thousand college graduates, which showed earning of college expenses to be a neutral factor in success as measured by salary and promotions.

SIZE OF FAMILY

Psychoanalysts and various persons interested in child welfare and college personnel research have stated that the only child is more frequently a problem—emotional, disciplinary, scholastic, etc.,—than are individuals having one or more brothers and sisters. The data of table 4 are sharply in contrast with this belief. More than twice as many distinguished students (37.1 per cent) as non-distinguished students (16.7 per cent) have no brothers or sister. Indeed, there is a rather noticeable tendency for scholastic distinction to be inversely proportional to the number of children in the family from which the individual comes. It may still be true and probably is that individuals without brothers and sisters tend to constitute an educational problem. The problem, however, would seem to be more that of adjusting the college to the needs of superior students, than that of adjusting deficient students to minimum standards so as to make such individuals better college risks. Socio-economic and cultural level as related to birth control is probably a significant factor in these results.

OCCUPATION OF PARENTS

The inferences concerning economic and cultural background made in the preceding section are supported by the data of table 5 which show a clearly significant difference in favor of students coming from homes in which the father is a professional man. Approximately two and one half times as many distinguished students as non-distinguished students come from this type of family, and the difference is statistically highly reliable. While there seems to be a tendency for a greater proportion of non-distinguished students to come from homes in which the father is a semi-skilled worker, this

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them is very highly reliable statistically, are nevertheless of a sort which are harmonious with prevailing impressions: The distinguished students report that they have a slightly larger number of intellectual hobbies, intellectual-mechanical hobbies, and musical hobbies; and a larger proportion of the non-distinguished students mention no hobby at all. Ed.]

TABLE 4

Number and percentage of brothers and sisters of distinguished and non-distinguished students

NUMBER OF BROTHERS AND SISTERS	DISTINGUISHED		NON-DISTINGUISHED		DIFFERENCE IN PERCENTAGES	$\frac{\text{Diff}}{\text{P.E.}_{\text{diff}}}$
	Number	Cumulative percentage	Number	Cumulative percentage		
0	119	37.1	50	16.7	20.4	8.71
1	61	56.1	59	36.3	20.2	7.51
2	47	70.7	77	62.0	8.7	3.24
3	42	83.8	48	78.0	5.8	2.72
4	23	91.0	21	83.0	8.0	4.30
5	8	93.5	15	90.0	3.5	2.33
6	6	95.3	10	93.3	2.0	2.11
7	4	96.6	10	96.7	0.1	1.01
8	7	98.8	4	98.0	0.8	1.03
9			1	98.3		0.00
10	3	99.7	3	99.3	0.4	0.70
11						
12	1	100.0	2	100.0		
Total.....	321		300			
Mean.....	1.79		2.47			

This table is to be read: 37.1 per cent of distinguished students have no brothers and sisters, compared with 16.7 per cent of non-distinguished students having no brothers and sisters; the difference between these percentages is 20.4, and the significance of this difference is 8.71.

TABLE 5

Occupation of parents of distinguished and non-distinguished students

OCCUPATION	DISTINGUISHED		NON-DISTINGUISHED		PERCENTAGE DIFFERENCE	$\frac{\text{Diff}}{\text{P.E.}_{\text{diff}}}$
	Number	Percentage	Number	Percentage		
Professional	70	14.5	17	5.7	8.8	6.20
Technical	212	44.0	143	47.7	3.7	2.15
Skilled	38	7.9	20	6.7	1.2	0.89
Semi-skilled	29	6.0	30	10.0	4.0	2.90
Unskilled	11	2.3	7	2.3	0.0	0.00
Agriculture	118	24.3	82	27.3	3.0	1.35
Retired	4	0.8	1	0.3	0.5	1.56
Total	482	100.0	300	100.0		

difference is not completely reliable and in any case it is relatively small.

RURAL VS. URBAN ENVIRONMENT

Table 6 shows a tabulation of students' reports as to the environment in which they grew up, *i.e.*, whether rural or urban. These environments are evidently significantly related to differences in scholastic achievement. A city environment furnishes more than half of all the distinguished stu-

dents, while appreciably less than a third of non-distinguished students come from the city. Throughout it is apparent that a rural environment lessens the students' chances of appearing on the distinguished list. The cases in which students have lived in both rural and urban environment are probably to be accounted for in terms of migration from country to town and city rather than the reverse, in view of the well known trend in this direction.

TABLE 6

Environment (country or city) from which distinguished and non-distinguished students are drawn

	DISTINGUISHED		NON-DISTINGUISHED		PERCENTAGE DIFFERENCE	Diff / P.E. diff
	Number	Percentage	Number	Percentage		
Country	54	13.5	48	16.0	2.5	1.30
Town	88	22.1	52	17.3	4.8	2.34
City	219	54.9	93	31.0	23.9	9.64
Country and Town	10	2.5	30	10.0	7.5	5.40
Country and City	7	1.8	21	7.0	5.2	4.64
Town and City	11	2.8	25	8.3	5.5	4.40
Country, Town, and City	10	2.5	31	10.3	7.8	5.82
Total	399	100.0	300	100.0		

It is likely that the major portion of the life of a student reporting both country and town, or country and city, was spent in the rural environment, the parents having migrated to the city upon retirement from farming, when in the majority of cases the children would be well along in their educational careers. The general facts concerning the relationship of rural and urban environment to scholastic competence and achievement are also borne out by the results of the freshman placement tests, which show a significantly higher average for students from a city environment than dents from a city environment for students from country. The figures, of course, give no insight into the more remote causes of these differences. It may be that the rural environment is less conducive to intellectual stimulation and growth. It is also quite possible that the more able parents—who tended to have more able children—have tended to migrate to the city.

LENGTH OF HIGH SCHOOL TERM AND SIZE OF HIGH SCHOOL

Indiana has high schools which differ considerably in the length of the school year. The shortest are eight months in length and the longest ten months. Table 7 shows that more than one third of all distinguished students come from high schools with a school year of 9.5 to 10 months, while only one fourth of non-distinguished students come from schools with this length of school year. The differences for the short

term high schools are not clearly significant, but the early elimination of freshmen from these short term high schools is much greater, the majority of those dropping out before the end of their first semester being those who come from high schools of this type. These students, of course, are not included in the tabulation, since only students who had been in school at least one semester were studied.[3]

TABLE 7

Percentages of distinguished and non-distinguished students drawn from high schools with varying lengths of school terms

	10 AND 9½ MONTHS	9 MONTHS	8½ AND 8 MONTHS
Distinguished	34.3	43.7	22.0
Non-distinguished	25.0	49.1	25.9
Difference	9.3	5.4	3.9
$\frac{\text{Diff}}{\text{P.E.}_{\text{diff}}}$	3.54	1.85	1.56

TABLE 8

Percentages of distinguished and non-distinguished students drawn from various size high schools

	LARGE 200–5,299	SMALL 0–199
Distinguished	71.5	28.5
Non-distinguished	60.7	39.3
Difference	10.8	10.8
$\frac{\text{Diff}}{\text{P.E.}_{\text{diff}}}$	3.86	3.86

The size of the high school, that is, the number of students enrolled, is also a significant factor in relation to scholarship. Table 8 gives the facts in summary. Nearly three fourths of the distinguished students come from the larger high schools, while only 60.7 per cent of non-distinguished students come from this type of high school. The figures for the small high school are, of course, exactly the reverse.

It is to be remembered that size and length of terms of high schools are closely correlated, the smaller high schools being in the majority of cases the short term high schools.

TABLE 9

Number of relatives graduating from Purdue University for distinguished and non-distinguished students

NUMBER OF RELATIVES	DISTINGUISHED, N = 531	NON-DISTINGUISHED, N = 300
17		1
5	1	
4	1	3
3	7	3
2	12	14
1	37	39
Total	58	60
Percentage with relatives	10.9	20.0
Percentage difference	9.1	
$\frac{\text{Diff}}{\text{P.E.}_{\text{diff}}}$	4.94	

RELATIVES GRADUATED FROM PURDUE

From table 9 it is evident that non-distinguished students have a greater proportion of relatives who graduated from Purdue University than do the the distinguished students, in fact nearly twice as many. Possibly this is to be accounted for by relatives of

[3] See Stalnaker, J. M., and Remmers, H. H. What Kind of High Schools Contribute to College Failures? *Studies in Higher Education XIV, Bulletin Purdue University*, March, 1930, Vol. XXX, No. 5, p. 40.

non-distinguished students with sentimental ties to the University advising them to come to Purdue even though this may not be the best institution for their particular educational needs. Possibly also the distinguished students exercise better, more independent judgment in selecting the schools to which they go. Be the facts what they may, the difference in any case is quite significant and statistically entirely reliable.

SUMMARY

By way of summary it will perhaps be most useful to give a characterization of the distinguished student. A student's chances for appearing on the list of distinguished students are enhanced in varying amounts if the following facts can be affirmed of him:

(1) Having a high standing on entrance tests.

(2) Being in the Schools of Agriculture, Chemical Engineering, or Science.

(3) Being a junior or senior rather than a freshman or sophomore.

(4) Being younger than the modal age at entrance.

(5) Being slightly heavier than average.

(6) Being less interested in sports than the average student.

(7) Having a self-rating above average on the trait *native capacity*.

(8) Being rated above average on the Purdue Personnel Rating Scale.

(9) Being an only child or one of two children in the family.

(10) Coming from a large, long-term city high school.

(11) Having a father who is a professional man.

(12) Having no or few relatives graduating from Purdue University.

It should of course be borne in mind that the conclusions arrived at in this study apply in logical strictness only to Purdue University. In other institutions certain of these variables might be found to be neutral or even related to scholastic success in a manner opposite to that obtained here. It is my belief, however, that by and large they are of general import for institutions of the type represented by Purdue University.

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Trends in Educational Personnel Research[1]

By Ruth Strang, *Teachers College, Columbia University*

It is wholesome now and again to get a bird's-eye view of trends in research, and to reflect, as Professor Strang has done, on the need for filling out the gaps and for employing more rigorous techniques of investigation.

Trends in research relating to personnel work in educational institutions were studied by analyzing 582 articles published in ten magazines during the past ten years. There has been an increase of approximately two hundred per cent in the number of research articles in this field from 1920 to 1930. The growing interest in the college field is shown by the fact that in the last five years there were twice as many studies relating to college as to high school personnel work. The methods of collecting data most frequently employed were intelligence tests, teachers' marks, and questionnaires. The favorite statistical methods of treating data were the frequency distribution, coefficient of correlation, mean, median, and standard deviation. The problems studied related primarily to educational guidance, selective admissions, personality traits, and general problems of counseling.

PREVIOUS analyses (1–6) have shown the relative number and nature of different types of investigation in the broad field of educational research. This article attempts to report in greater detail an analysis of one phase of this work; namely, research in personnel work in educational institutions.

Educational research has been broadly defined as "the process of critical reflective thinking on the basis of the best data available" (5). Personnel work has been defined as "work having to do specifically with the individual" (7). Thurstone defined personnel research as "the study of the conditions under which productive work may be made a truly integral part of living" (8). The studies analyzed in this article include investigations concerning conditions, (a) before the student comes to the institution: in selective admission procedures; (b) during the first few weeks of his college course: in registration, selection of courses, testing, housing, and initial orientation programs; (c) during the entire high school or college course: in personal advice regarding a great variety of matters, in provision for health, and for religious and social life

[1] The author is indebted to the students in her course in Research in Educational Guidance, and to Miss Clara Altman, Miss Irene Eldred, and Miss Helen Salzer for additional assistance in re-checking and tabulating the material.

that will meet the needs of individual students, in vocational and educational guidance, and in assistance in securing part-time employment; and (d) after graduation: in placement and follow-up programs. Research has been reported along each of these lines.

This study is limited to the research articles dealing with these phases of high school and college life, which were found in the ten magazines publishing the largest number of such articles from January 1, 1920, to January 1, 1930.

The magazines were examined chronologically for reports of investigations relating to educational personnel work. The statement of the problem, the number of cases, and methods of collecting and treating the data were recorded and tabulated with reference to each article.

Specific answers to the following questions were obtained:

1. What has been the increase during the past ten years in the number of published investigations relating to personnel work?
2. In which periodicals are the largest number of investigations reported?
3. How does the number of investigations relating to personnel work in college compare with the number relating to personnel work in high school?
4. How many cases were used in these investigations?
5. Which methods of collecting data have been most widely used?
   What differences in methods were found,
   a. from 1920 to 1930?
   b. among different magazines?
6. Which methods of treating data have been most widely used?
   What differences were found,
   a. from 1920 to 1930?
   b. among different magazines?
7. Which topics have been studied most frequently?

I. INCREASE IN NUMBER OF INVESTIGATIONS

Thirty-seven of 582 articles studied were published in 1920; 72, in 1929.

Although there are fluctuations in the number of investigations published from year to year, there has been an increase of approximately two hundred per cent from 1920 to 1930. (See Table 1.) The peak of publication of articles dealing with student personnel in these ten magazines was in 1927–1928. Whether the smaller number of investigations found in 1929 represents merely a yearly fluctuation or the beginning of a downward trend in interest in this subject can be ascertained only by continuing this study through the coming years.

II. PERIODICALS PUBLISHING THE LARGEST NUMBER OF ARTICLES

The question has frequently been asked by personnel workers in high school and college, "Which magazines publish the largest number of articles relating to my work? To which magazines shall I subscribe? Which shall I order for our library or professional club?" These questions are partially answered in this section.

The largest number of investigations relating to personnel work in educational institutions was found in *School and Society*. This is to be expected, since *School and Society* is published weekly, includes in each issue at least

one report of research, and is keenly interested in work with individuals. The *School Review* ranks second. The *Personnel Journal* usually includes at least one article in the field of education in each issue, and although the majority of articles deal with personnel work in industry, many of the principles and techniques used in industry are applicable to educational institutions. The other magazines in order of frequency are: *Journal of Educational Research*, *Journal of Applied Psychology*, *Journal of Educational Psychology*, *Journal of Educational Administration and Supervision*, *Teachers College Record*, *Journal of Abnormal and Social Psychology*, and *The American Physical Education Review*.

III. NUMBER OF INVESTIGATIONS RELATING TO HIGH SCHOOL AND COLLEGE

The total number of articles on the college level during the ten-year period is 357; on the high school level, 225. The ratio of college articles to high school articles during the first five years of the decade, is approximately four to three, while during the last five years the ratio approaches ten to five, showing an increasing emphasis upon research relating to student personnel in institutions of higher education.

The majority of the 174 articles published by *School and Society* during the ten-year period relate to personnel work on the college level. The *School Review*, on the other hand, is primarily interested in personnel work in the high school. The majority of the articles found in the *Personnel Journal*, *Journal of Applied Psychology*, and *The Journal of Abnormal and Social Psychology* relate to the college field.

IV. NUMBER OF CASES

The mean number of cases used in these investigations was computed, but was found to be very misleading since it was greatly influenced by a few articles reporting exceptionally large numbers of cases. Including these extreme cases resulted in a mean of 1,475. As a matter of fact, the number of cases most frequently found was from 100 to 500. During the ten-year period the distribution of cases was as follows:

NUMBER OF CASES	NUMBER OF ARTICLES
Less than 25	24
25–49	39
50–99	73
100–499	230
500–999	85
1000–4999	90
5000 or more	32

The distribution of cases for each year was similar, and no trends toward using a larger or a smaller number of cases were evident from 1920 to 1930.

V. METHODS OF COLLECTING DATA

There are a great many ways of collecting data concerning individuals: testing them in intelligence, achievement, character, interests, emotional stability, and motor ability; marking them on their academic work; rating them on a variety of traits; observing their specific behavior; questioning them directly or questioning other people concerning them; interviewing them; having them keep records of their daily activities or records of

special phases of their activity; studying letters they have written or voluntary opinions they have expressed; using routine information already available in offices; and other less frequently used methods. Table 1 shows the principal methods used year by year, in the research studies here reported.

Intelligence tests. The method of collecting data most frequently used in these investigations was intelligence testing. The favorite intelligence tests on the college level during the period of ten years were the Army Alpha, Thorndike, Thurstone, Otis (both Group and Self-Administering), and Terman Group Tests of intelligence. On the junior and senior high school levels the Terman Group test was the most popular; and the Otis, Army Alpha, and National Intelligence tests, next in frequency. After the first four enthusiastic years—1920–1923—there was in 1924 a decrease in the percentage of investigations employing intelligence tests, and since that time there has been a tendency to continue on the 1924 level, a level which is still high as compared with other methods of collecting data. Intelligence seems to be a type of information desired in almost half of the personnel researches in all of the magazines.

Achievement tests. It is interesting to see how far achievement tests fall behind intelligence tests in frequency of use in these research articles. Only 10 per cent of all the investigations used achievement tests. No definite trend was found during the period of ten years. Thirty-four different achievement tests were mentioned, no one of which was used more than four times.

Other tests. Personality, character, and interest tests were used in 46 of the studies, 8 per cent of the total. The tests most frequently used were the Downey Will-Temperament Test, Pressey X-O Test, Colgate Mental Hygiene Test, Woodworth Personal Data Sheet, the Woodworth and Wells Association Test, the Kent-Rosanoff Association Test, and the Freyd Interest Blanks. The majority of tests of this type were reported in investigations in two magazines, namely, *The Journal of Applied Psychology* and *The Journal of Abnormal and Social Psychology.*

Teachers' marks. Table 1 shows that 42 per cent of the studies used teachers' marks. Approximately half of the teachers' marks were obtained in colleges, and half in high schools. There seems to be a trend during the ten years to an increasing use of teachers' marks.

Questionnaires. This much despised and abused method of collecting data is third in frequency. It will be noted, however, that only 42 per cent of the questionnaires were sent to teachers and administrators, the other 58 per cent being inflicted upon students. There is wide variation among the magazines in reporting the use of this method. In one magazine the use of the questionnaire was reported in 10 per cent of the articles; while in another this method of collecting data was used in 41 per cent of the investigations.

Rating scales. The use of rating scales shows an interesting increase up to the year 1926, in which year this

method was reported in 19 per cent of the articles. The percentage decreases to 10 per cent in 1929. The average for the ten years is 14 per cent. This decrease may be a chance yearly variation. It may, on the other hand, represent the beginning of a tendency to rely less on data from rating scales.

filed in offices about students was used in 12 per cent of the investigations. Accurate material already collected for practical purposes over a period of years is too often overlooked as a source of data in personnel research.

Special records. In 8 per cent of the articles, the authors reported that data

TABLE 1

Principal methods of collecting data

METHOD	1920		1921		1922		1923		1924		1925		1926		1927		1928		1929		TOTAL	
	Number of cases																					
	37		28		33		41		51		72		58		92		98		72		582	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Intelligence Tests	21	57	16	57	17	52	28	68	21	41	34	47	26	45	42	46	43	44	29	40	277	48
Teachers' Marks	11	30	7	25	10	30	23	56	20	39	33	46	30	52	40	43	41	42	29	40	244	42
All Questionnaires	7	19	4	14	8	24	6	15	10	20	14	19	18	31	21	33	27	28	23	32	138	24
Questionnaires to students	3	8	2	7	3	9	4	10	4	8	8	11	10	17	16	17	16	16	13	18	79	14
Questionnaires to others	4	11	2	7	5	15	2	5	6	12	6	8	8	14	5	5	11	11	10	14	59	10
Rating Scales	2	5	3	11	3	9	5	12	9	18	12	17	11	19	13	14	16	16	7	10	81	14
Office Records	6	16	3	11	3	9	4	10	5	10	15	21	5	9	14	15	11	11	3	4	69	12
Achievement Tests	3	8	1	4	0	0	4	10	7	14	4	6	5	9	7	8	16	16	10	14	57	10
Special Records	1	3	2	7	4	12	3	7	0	0	2	3	3	5	8	9	13	13	7	10	44	8
Tabulation of printed material	1	3	1	4	2	6	2	5	6	12	7	10	4	7	1	1	6	6	3	4	33	6
Character and Interest Tests	0	0	0	0	3	9	1	2	1	2	7	10	3	5	3	3	5	5	2	3	25	4
Tests of Emotion	0	0	2	7	1	3	0	0	0	0	3	4	2	3	7	8	2	2	4	6	21	4
Daily Schedules	2	5	1	4	1	3	0	0	1	2	1	1	2	3	3	3	6	6	6	8	23	4
Interview	3	8	0	0	1	3	2	5	2	4	3	4	1	2	3	3	6	6	4	6	25	4
Physical and Physiological Measures	1	3	1	4	0	0	4	10	3	6	3	4	3	5	3	3	3	3	2	3	23	4
Observation	1	3	2	7	2	6	1	2	1	2	1	1	2	3	4	4	8	8	4	6	26	4
Tests of Motor Ability	0	0	1	4	0	0	1	2	1	2	1	1	1	2	1	1	2	2	1	1	9	2

The criticism of rating scales by Kornhauser (9), Knight and Franzen (10), Symonds (11), and others, may possibly explain the apparent decrease in the use of this technique, although the simultaneous improvements in rating technique suggested should tend to increase their use.

Office records. Routine information

were collected by means of special records kept over a period of time. This method seems to be superior to the questionnaire, and one which should be used increasingly.

Tabulation of printed material. Catalogues, textbooks, and other printed material were the source of data in 6 per cent of the studies. The value

of such data depends largely upon the critical thinking of the author on the basis of the data which he has tabulated.

Other methods of collecting data. Daily schedules, interviews, physical and physiological measurements, and observation were each used in 4 per cent of the investigations. The value of the first two methods depends largely upon gaining the coöperation and interest of the subject. The daily schedule furnishes a wealth of detailed information concerning the twenty-four-hour activities of students and the professional day of adults. It is a valuable supplement to the case record. So much has already been written on the interview that this method of collecting data will not be discussed further here. The physical and physiological measurements approach a scientific accuracy not reached by the other methods used in this field. Observation, which is the method of the biological sciences, should be developed further in the field of personnel research.

TABLE 2

Principal methods of treating data

	1920		1921		1922		1923		1924		1925		1926		1927		1928		1929		TOTAL	
	Number of cases																					
	37		28		33		41		51		72		58		92		98		72		582	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Frequency Distribution:																						
Number	25	68	13	46	20	61	24	58	25	49	40	55	34	59	52	56	50	51	41	57	323	55
Per cent	16	43	11	39	11	33	17	41	23	45	27	38	23	40	44	48	37	38	35	49	245	42
Mean	9	24	10	36	6	18	11	27	20	39	26	36	25	43	35	38	41	42	30	42	211	36
Median	12	32	11	39	9	27	13	32	17	33	19	26	17	29	24	26	25	26	22	30	168	29
Mode	1	3	1	4	1	3	0	0	2	4	0	0	2	3	0	0	0	0	0	0	8	1
Quartiles	4	11	3	11	9	27	5	12	3	6	7	10	5	9	6	6	12	12	3	4	56	10
Percentiles	4	11	1	4	1	3	4	10	3	6	3	4	4	7	9	10	9	9	6	8	44	8
Range	10	27	7	25	7	21	3	7	5	10	10	14	6	10	13	14	17	17	9	12	87	15
Standard Deviation	3	8	2	7	2	6	6	15	6	12	17	24	18	31	17	18	18	18	13	18	102	18
Ranking	5	14	6	21	1	3	6	15	3	6	8	11	7	12	17	18	13	13	12	17	78	13
Correlation, Product-Moment	15	40	11	39	10	30	21	51	17	33	34	47	20	34	36	39	31	32	26	36	219	38
Probable Error:																						
Of Mean	2	5	0	0	1	3	2	5	9	18	4	6	6	10	8	9	7	7	3	4	42	7
Of Difference	1	3	0	0	1	3	0	0	2	4	1	1	2	3	3	3	3	3	2	3	15	2
Of Correlation	4	11	1	4	2	6	6	15	9	18	15	21	5	9	12	13	17	17	6	8	78	13
Column and Bar Diagrams	7	19	1	4	3	9	2	5	2	4	4	6	2	3	9	10	8	8	2	3	40	7
Line Graph	1	3	5	18	2	6	5	12	8	16	14	19	10	17	10	11	13	13	4	6	72	12
Case Studies or Description	1	3	1	4	0	0	1	2	1	2	4	6	1	2	4	4	2	2	0	0	15	2

VI. METHODS OF TREATING DATA

The methods of treating the data fall into seven groups: making a fre-

quency distribution; finding the central tendency; computing percentiles and measures of dispersion; finding relationships; ascertaining the sampling reliability of measures; representing the data graphically; and using case studies and other descriptive material. Each of these will be discussed briefly. A more detailed study may be made by the reader directly from table 2.

Frequency tables. The simplest and most common treatment of data in these investigations was the frequency table. In 55 per cent of the articles the frequency was expressed in numbers, and in 42 per cent, in percentages. No trend toward an increase or a decrease in the number of frequency tables published was indicated.

Measures of central tendency. The mean is the favorite measure of central tendency, the median is computed less frequently, and the mode is rarely used. The number of investigations using the mean has increased from 24 to 42 per cent during the period of ten years. The articles in the *Journal of Educational Psychology* and the *Journal of Applied Psychology* report the mean more frequently and the median less frequently than any of the other magazines.

Percentiles. Quartiles and other percentiles are useful measures which are reported in all of the magazines throughout the period of ten years.

Measures of dispersion. The standard deviation was computed in 18 per cent of the investigations. There is a decided tendency to use this statistical measure increasingly. In the first three years of the period the standard deviation was used in six to eight per cent, and in the last three years, in 18 per cent of the investigations. The two magazines in which the standard deviation is most frequently found are the *Teachers College Record* and *Journal of Educational Psychology.*

The range was given in approximately one-fourth of the articles in the first three years, but less frequently thereafter. The semi-interquartile range (Q) was used in only one per cent of the investigations.

Measurement of relationships. The product-moment coefficient of correlation seems to be especially appropriate for investigations in the field of personnel work. It was used throughout the ten-year period in 38 per cent of the studies. In the *Journal of Educational Psychology* and *The Journal of Abnormal and Social Psychology* this technique was reported in more than half of the articles. Partial and multiple correlations were found in only 2 and 3 per cent of the articles respectively, and only in the years after 1924. In 1929, 14 per cent of the investigations used the technique of partial correlation, and 18 per cent the technique of multiple correlation. The 1929 interest in the use of partial and multiple correlation in personnel research may decrease as the difficulties in the use of these methods are understood more fully. The Spearman rank coefficient was used in one per cent of the studies.

Measures of reliability. The probable error of a mean, of a difference between two means, and of a coefficient of correlation was reported more frequently in the last five than in the first five years of the ten-year period. The probable error of these measures should be computed whenever it is

appropriate to do so, because without such computation an accurate interpretation of the sampling significance of a difference and of a coefficient of correlation is impossible. The failure to calculate the probable error of the coefficient of correlation is a statistical shortcoming mentioned by Spearman in 1904 and one which according to table 2 is still persisting. The *Journal of Applied Psychology* and *The Journal of Abnormal and Social Psychology* have reported in their personnel research articles the probable errors of differences and coefficients of correlation more frequently than any of the other magazines studied.

Graphic representation. Bar and column diagrams were found in 7 per cent, and line graphs in 12 per cent of the articles. These graphic means of presenting data were not limited to any special years or magazines.

Case studies and descriptions. In 2 per cent of the articles, parts of case studies or other descriptive material was included. The qualitative picture which such descriptive material gives is often a valuable supplement to the statistical treatment of the data.

Other statistical methods such as the coefficient of reliability, biserial r, and the coefficient of variation were used a negligible number of times.

VII. TOPICS STUDIED

The principal types of subjects investigated during the period of ten years are briefly summarized in table 3. There was not sufficient variation from year to year to warrant including the number and per cents for each year in the table.

Classification according to topics was difficult and unsatisfactory because many articles, such as those reporting the relationship between two or more factors, might be classified under several headings.

Nevertheless, the emphasis on educational guidance is interesting. Under this heading were classified the many studies of the relationship between intelligence and achievement, the factors associated with academic failure and success, and the outcome of various experiments on how to study.

TABLE 3

*Principal topics of research during ten-year period (571 articles)**

TOPIC	NUMBER	PER CENT
Educational guidance	150	26
Counseling	77	13
Selective Admissions	66	12
Personality traits	64	11
Social life and extra-curricular activities	54	9
Vocational guidance	38	7
Student government, discipline, and good citizenship	19	3
Rating scales	19	3

* *American Physical Education Review* was omitted from this tabulation.

Counseling problems, selective admissions, and personality traits were favorite topics of investigation throughout the ten years in the majority of the magazines studied.

Interest in the social program and extra-curricular activities was confined largely to two magazines—*School and Society* and *The School Review.*

The percentage of articles relating to vocational guidance is significant in view of the fact that no magazine primarily interested in vocational guidance was included in the study.

The attention given to discipline problems was negligible, the subject being approached from the positive angle of student government and good citizenship.

The small number (less than three per cent) of investigations of factors in the selection of courses, housing, orientation, the interview, part-time employment and placement, scholarships, follow-up studies of alumni, and organization and personnel of work with individuals indicates gaps in the body to knowledge relating to personnel work in educational institutions which should be filled. The mere number of investigations, however, does not indicate a satisfactory solution of a problem. One investigation may be of more value than ten or more insignificant studies.

VIII. SUMMARY AND DISCUSSION

The number of articles reporting some phase of educational research relating to student personnel has approximately doubled in the past ten years.

The three sources of data most frequently used were intelligence tests, teachers' marks, and questionnaires. Intelligence tests, which were used enthusiastically in the years 1920 to 1923, have not been so widely used during the last four years. No similar diminution in the number of investigations depending upon questionnaires was noted. There has been a slight increase in the use of teachers' marks, in spite of the articles which have pointed out the unreliability of these estimates of academic achievement. Methods such as observation, the daily schedule, and special records which were not widely used in the investigations studied, have possibilities for research in student personnel which might well be developed.

Frequency tables giving the number of cases in each class, the per cent, or both are found in almost half of the articles.

The mean is increasingly used as a measure of central tendency, and the median to a less extent. This tendency seems statistically desirable since, as Holzinger points out, "for most problems, however, the mean is distinctly superior and should be used unless there is some very good reason to the contrary" (12).

The increased computation of the standard deviation and the probable error of means, differences, and coefficients of correlation seems also to indicate a tendency to make research in this field more precise.

The coefficient of correlation is found in one-third of the articles and is an especially appropriate statistical method to use in studying "the relation between working and living."

Some of the trends in methods of treating data,—such as an increased use of the mean as a measure of central tendency, and increased computation of the probable error—are in line with progressive research procedures. Further progress should be made in the use of more precise methods of collecting data,—such as standardized tests, observation, and adequately controlled experiments,—and in the selection of statistical methods which can appropriately be applied to the data obtainable in this field.

The topics studied show a marked emphasis on the use of tests in educa-

tional guidance, counselling and selective admissions. When the entire field of personnel work in high schools and colleges is considered, there are many obvious gaps in definite knowledge. These need to be filled by the results of research which aims to discover better methods of working with individuals.

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Base Rates *vs.* Bonus Payments in Wage Comparisons for Standard Machine-tool Occupations

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In setting wage rates for different factory occupations it is obviously essential to have a sound basis on which to compare earning capacity in these occupations. Mr. Frain shows the folly of using base rates for this purpose, without considering bonuses paid, or actual earnings.

Hourly base rates are frequently used in wage comparisons designed to show earning capacity. Whatever merit such comparisons may have where a straight time method of wage payment is involved does not logically carry over to comparisons involving earnings under incentive methods, unless certain assumptions with regard to actual results and experience under these methods are valid. An examination of such assumptions is made, in the light of two wage surveys covering seven standard machine tool occupations in metal manufacturing firms of Philadelphia. These data indicate that pragmatic results support logic in disqualifying base rates as evidence of earning capacity.

THE not infrequent use of hourly base rates in wage comparisons seems to justify an examination of their validity for this purpose. Sometimes they are used alone as indicating earning capacity and sometimes they are used in estimating actual earnings in some longer period, perhaps a week. Where incentive methods of wage payment exist this procedure cannot be reconciled logically with the assumptions of such methods, although it might be justified under certain assumptions as to the actual results of these methods. One possible assumption is that the proportion of incentive workers is not sufficiently large to affect the general results obtained from base rates for time workers. Again it might be assumed that earnings are about the same for both time and incentive workers, so that the base rates of the former are indicative of earning power for both groups. Or it might be assumed that even with differences in earnings the base rate under each method reflects earning capacity. This implies that either no large proportion of incentive workers receive amounts in excess of their base

rates or that if such payments are widely received they are not appreciable in amount.[1]

Without attempting to generalize on the accuracy of these assumptions for industry as a whole, it is possible to check their validity in certain important occupations in one prominent industrial area. Seven standard machine-tool occupations[2] were made the base of two wage surveys among metal manufacturing firms in the Philadelphia market.[3] The first of these was made in April, 1927 and the second in October, 1929; forty-three firms reporting 1456 men coöperated in the former and 49 firms with 1870 men coöperated in the latter period. Although the main purpose of these surveys was not to check the significance of base rates, they do furnish evidence in this regard.

No general significance can be attached to base rates on the assumption that incentive methods of wage payment are not widely used in the selected occupations. From table 1 it appears that about 74 per cent of all machine-tool operators in 1927, and about 84 per cent in 1929, were paid in this way. And these percentages are fairly representative of those for the individual occupations. Incentive methods, as the term is used here are those in which at least a part of the worker's compensation is related directly to his output as distinct from a time method where earnings are related directly to only the time consumed in performing a job. In a previous study[4] a distinction was also drawn between piece[5] and bonus

TABLE 1

Number and percentage of total number of men paid on an incentive basis, by occupations, 1927 and 1929

OCCUPATION	NUMBER OF MEN		PERCENTAGE	
	1927	1929	1927	1929
Boring Mill Operator	127	220	85	92
Drill Press Operator	186	288	76	85
Engine Lathe Operator	264	411	64	81
Milling Machine Operator	161	235	78	87
Planer Operator	35	74	60	81
Screw Machine Operator	202	185	78	77
Turret Lathe Operator	101	149	81	82
Combined	1076	1562	74	84

[1] Variation in working time as a limiting factor in the significance of hourly base rates is disregarded in this analysis.

[2] Drill press, boring mill, engine lathe, milling machine, planer, screw machine and turret lathe operating.

[3] Mr. Earl Sparks, Secretary of the Philadelphia Metal manufacturers Association cooperated in arranging these surveys.

[4] *An Examination of Earnings in Certain Standard Machine-Tool Occupations in Philadelphia*, Philadelphia: University of Pennsylvania Press, 1929.

[5] A piece method of payment was defined as one under which workers were paid

methods of payment, but subsequent data cast doubt on the significance of this distinction for the occupations being considered.

median figures for both hourly earned rates (hourly earnings) and actual weekly earnings in 1927 and 1929. In the latter period the average earned

TABLE 2

Average and median earnings for specified occupations by method of payment, 1927 and 1929

OCCUPATION	HOURLY EARNINGS				WEEKLY EARNINGS			
	Average		Median		Average		Median	
	Time	Incentive	Time	Incentive	Time	Incentive	Time	Incentive
1929								
Boring Mill Operator	78.6	81.8	76.7	79.2	39.22	45.24	38.15	42.20
Drill Press Operator	61.8	71.1	64.0	67.7	33.02	36.08	32.50	34.15
Engine Lathe Operator	68.5	79.7	69.9	77.5	34.93	41.93	35.60	39.50
Milling Machine Operator	70.0	85.3	71.9	80.9	36.80	45.90	37.75	41.15
Planer Operator	73.4	83.9	74.9	78.6	40.41	46.65	35.99	39.50
Screw Machine Operator	76.9	76.2*	79.0	72.4*	37.95	39.09	38.75	37.00*
Turret Lathe Operator	62.2	71.5	64.6	71.8	31.41	35.42	32.20	35.85
Combined	69.2	78.2	69.6	75.2	35.54	41.18	35.42	38.30
1927								
Boring Mill Operator	70.9	74.5	70.6	74.0	35.69	38.02	36.25	38.05
Drill Press Operator	59.2	65.1	63.9	64.9	28.67	33.44	28.30	33.65
Engine Lathe Operator	66.0	78.0	66.1	76.8	33.27	39.12	32.90	38.15
Milling Machine Operator	63.7	71.1	63.4	71.3	31.57	35.89	27.30	35.60
Planer Operator	66.3	74.9	66.3	74.3	38.29	36.57*	36.65	37.70
Screw Machine Operator	64.3	74.1	66.4	73.7	31.43	36.28	32.40	35.85
Turret Lathe Operator	66.2	73.3	64.8	70.8	33.60	35.97	34.00	34.55
Combined	64.7	73.1	65.6	72.8	32.53	36.61	31.70	36.25

* Indicates instances where incentive earnings are lower than time earnings.

The second assumption is likewise invalid for there is both a persistent and an appreciable difference in earnings for time and for incentive workers. Table 2 gives the average and the rate for all time workers was 69.2¢ as against 78.2¢ for all incentive workers, and the average weekly earnings, or "take home money" was $35.54 and $41.18 for the respective groups. With the individual occupations there is also a difference in favor of the incentive group and it persists with both average and median figures not only in 1929 but also in 1927.

Moreover, these differences are ap-

directly on the basis of output with no immediate regard to the time consumed. The 1929 survey disclosed that nearly all incentive plans involved compensation on the basis of both time and output, such as with bonus and premium methods.

preciable in size. On the basis of average figures the hourly difference in favor of incentive workers is 13.0 per cent in *both* years, and the weekly difference is 15.8 per cent in 1929 and 12.5 per cent in 1927. Among the individual occupations the difference varies somewhat, but is generally at least 10 per cent and frequently more than 15 per cent. This is shown by table 3 which gives the percentage by which average incentive earnings exceed time earnings.

TABLE 3

Percentage by which average incentive earnings exceed average time earnings in specified occupations, 1929 and 1927

OCCUPATIONS	AVERAGE EARNINGS			
	Hourly		Weekly	
	1929	1927	1929	1927
	per cent	*per cent*	*per cent*	*per cent*
Boring Mill Operator	4.1	5.1	15.3	6.5
Drill Press Operator	15.0	10.0	9.3	16.6
Engine Lathe Operator	16.4	18.2	20.0	17.6
Milling Machine Operator	21.9	11.6	24.7	13.7
Planer Operator	14.3	13.0	15.4	−4.5
Screw Machine Operator	−0.9	15.2	3.0	15.4
Turret Lathe Operator	15.0	10.7	12.8	7.1
Combined	13.0	13.0	15.8	12.5

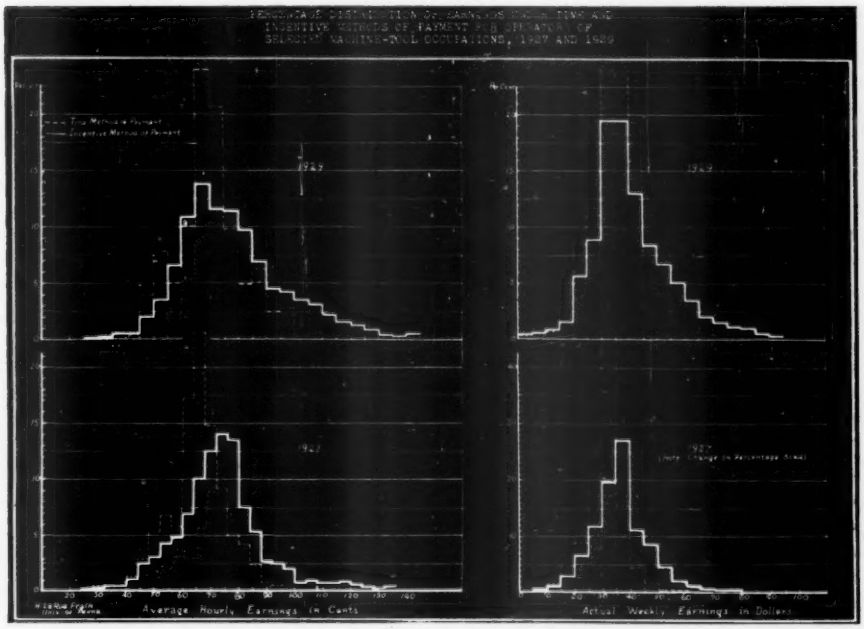
Just where the advantage lies with incentive workers is shown by chart 1 which gives the percentage distribution of hourly and weekly earnings for each group with the occupations combined. In both 1927 and 1929 more time workers receive the predominating (modal) earnings, or less, than do incentive workers, while more incentive than time workers receive amounts in excess of the predominating earnings. In 1927 the entire level of hourly and of weekly earnings is higher for the incentive group, but in 1929 the modal earnings are about the same for each group.

This similarity in predominating earnings for time and incentive workers in 1929 might be interpreted as supporting the assumption of about equal earnings for both groups despite different methods of payment. But this completely disregards the nature of the distribution either side of the modal figures, and for most general comparisons of earning capacity such disregard would be unwarranted. Furthermore, even the incentive workers receiving only modal earnings may have, by such earnings, amounts in excess of those provided by their base rates.

While the existence of a persistent and appreciable difference between time and incentive earnings suggests that the base rates of time workers cannot be assumed to reflect the earning capacity of incentive workers, still there is no direct evidence here that bonus payments in themselves are important in extent or in amount.

It is at least conceivable that a difference of 13 per cent in average earned rates in favor of incentive workers might arise from higher base rates for this group rather than from bonus payments. For a direct attack on the validity of base rates under bonus systems it is necessary to rely on only four of the 49 firms reporting in 1929. This number is extremely small, but the significance of the data is increased considerably by three circumstances. First, the data came unsolicited. No reference was made to base rates in the questionnaire to which the 49 firms responded. Second, these firms represent 618 men, or about 33 per cent of all those reported and about 40 per cent of all incentive workers. Third, three of the four firms are large in size, having 150, 159 and 291 men respectively.

From the data supplied by these firms it appears that the vast majority of their men did receive some bonus payment in the week covered by the survey. Table 4 shows that only 67 men or 10.8 per cent failed to receive a bonus. With the three large firms the failures ran from 7.9 per cent to 13.8 per cent, but reached 27.8 per cent in the small firm. It may be thought that a period of a week is too short a period on which to base con-



Note: These diagrams show only the continuous distribution earnings. Hourly earnings are plotted on a 4¢ interval in 1927 and a 5¢ interval in 1929. In each diagram earnings are plotted along the horizontal axis and percentage of the total number of cases are shown along the vertical axis. The percentage scale for weekly earnings in 1927 is only one half as large as the scale in 1929.

clusions as to the prevalence of bonus payments, but the data of one firm does not suggest it. This firm reported comparable information for each of three weeks and the proportion of men receiving bonus payments is even greater in the three-week than to invalidate the significance of base rates. Table 4 also gives the distribution of average hourly bonuses for each and for all of the four firms. For the combined firms these payments run from less than 5¢ to between 65¢ and 70¢ an hour. While

TABLE 4

Distribution of average hourly bonus payments for operators of seven standard machine-tools in each of four firms, 1929

AVERAGE BONUS PAYMENTS IN CENTS PER HOUR	FIRM 732		FIRM 35		FIRM 9		FIRM 52		TOTAL	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
No bonus	5	27.8	17	11.3	22	13.8	23	7.9	67	10.8
Under 5¢	5	27.8	20	13.3	36	22.6	15	5.1	76	12.3
5¢ and under 10¢	4	22.2	9	6.0	80	50.4	39	13.4	132	21.4
10¢ and under 15¢	4	22.2	23	15.3	8	5.0	26	8.9	61	9.9
15¢ and under 20¢			19	12.7	1	.6	31	10.7	51	8.3
20¢ and under 25¢			24	16.0	9	5.7	25	8.6	58	9.4
25¢ and under 30¢			10	6.7	1	.6	29	10.0	40	6.5
30¢ and under 35¢			11	7.3	2	1.3	20	6.9	33	5.3
35¢ and under 40¢			10	6.7			28	9.6	38	6.2
40¢ and under 45¢			3	2.0			17	5.8	20	3.2
45¢ and under 50¢			3	2.0			9	3.1	12	1.9
50¢ and under 55¢							13	4.5	13	2.1
55¢ and under 60¢							5	1.7	5	0.8
60¢ and under 65¢			1	0.7			4	1.4	5	0.8
65¢ and under 70¢							5	1.7	5	0.8
70¢ and under 75¢										
75¢ and under 80¢										
80¢ and under 85¢							2	0.7	2	0.3
Total	18	100.0	150	100.0	159	100.0	291	100.0	618	100.0
Average for firm:										
All men	5.4¢		6.4¢		17.4¢		24.6¢		17.6¢	
Men receiving bonus	7.4¢		7.4¢		19.7¢		26.7¢		19.3¢	

in the one-week period, being 94 per cent as against 88.7 per cent. Certainly there is nothing here to indicate that bonus payments are unimportant from the standpoint of number of workers receiving them.

The second point is whether or not the payments are sufficiently large this spread is co-extensive with that of one firm, it exceeds that of the other firms. In one of the other firms the maximum payments are between 45¢ and 50¢, in another between 30¢ and 35¢ and in a third between 10¢ and 15¢ an hour.

These high figures are received, of

course, by only a few individuals and may represent accumulated bonuses in some cases. But even when these extremes are cancelled against the opposite extreme the resulting averages are high. If the total payments were distributed evenly among all the men whether they earned bonuses or not, each would receive 17.6¢ an hour, while the general average for those actually earning bonuses is 19.3¢. On the basis of median figures the respective payments would be reduced to 12.5¢ and 15.1¢. The general average for firms varies rather widely; in two cases it is 7.4¢; in another it is 19.7¢ and is 26.7¢ in still another. Reductions of only a cent or two occur if the total payments of each firm are distributed among all of its workers.

Even if one takes the predominating payments they cannot be said to be unimportant in size. The modal bonuses are between 5¢ and 10¢ an hour, with about 25 per cent of all bonus recipients getting such amounts. These amounts also predominate in two of the large firms. If 7.5¢ is taken as the typical figure it is interesting to notice that such an amount increases the average base rate for all firms by 12.5 per cent. And this is very close to the 13 per cent by which average earned rates for all incentive workers exceed those for all time workers in both 1927 and 1929. Incidentally the average bonus in two of the firms is 7.4¢. One is inclined to wonder whether the average bonus for a larger group of firms might approximate the predominating bonus for these four firms. But in any event even the predominating bonus payments are large enough to influence greatly the earning capacity of workers.

There is still the possibility that over a longer period of time the average, median and predominating bonuses might all be smaller than shown here. In this connection it is interesting, and perhaps suggestive, to notice the experience of one large firm. This was the only one of the 49 firms reporting in 1929 which expressed doubt as to whether a week was a sufficiently long period for its data to be significant. They pointed out that bonuses were not paid until a job was completed, and since much of their work extended over more than a week, much of the bonus payments of any given week might be applicable to the preceding week. Accordingly the firm supplied information not only for the week requested but also for two others—one preceding and one following it. Analysis disclosed that average results were substantially the same in the one-week as in the three-week period. The average hourly bonus for all of its men was 17.4¢ in the one-week and 18.0¢ in the three-week period, while for those actually receiving bonuses the payments were 19.7 and 19.2¢ respectively. Moreover, the spread was only slightly less in the longer than in the shorter period as may be seen from table 5. In the one-week period it amounted to about 50¢ as against 45¢ in the three-week period. And if a few of the highest payments are excluded the spreads are reduced by only about 10¢, or to 40¢ and 35¢.

This does not mean that the distributions of bonus earnings were identical in the two periods, for they were not. In the shorter period more men received either small, if any, bonuses or large amounts than in the longer period; the concentration between the extremes being more pronounced in the longer than in the shorter period. Thus in the one-week period 24.6 per cent of the men received either less than 5¢ or nothing at all, as against 14.0 per cent in the three-week period, while amounts in excess of 35¢ were received by 11.4 per cent in the shorter as against 4.6 per cent in the longer period. On the other hand about 72.1 per cent had bonuses of between 5¢ and 30¢ in the three-week period while only 56.7 per cent had such amounts in the one-week period. Whether the experience of this firm is typical or not is unknown, but since it is the only one for which data are available in this connection its experience is worth noting.

TABLE 5

Distribution of average hourly bonus payments in a one-week and in a three-week period for operators of seven standard machine-tools in one firm, 1929

AVERAGE HOURLY BONUS PAYMENTS IN CENTS PER HOUR	ONE-WEEK PERIOD		THREE-WEEK PERIOD	
	Number	Percentage	Number	Percentage
No bonus	17	11.3	9	6.0
Under 5¢	20	13.3	12	8.0
5¢ and under 10¢	9	6.0	18	12.0
10¢ and under 15¢	23	15.3	21	14.1
15¢ and under 20¢	19	12.7	24	16.0
20¢ and under 25¢	24	16.0	23	15.3
25¢ and under 30¢	10	6.7	22	14.7
30¢ and under 35¢	11	7.3	14	9.3
35¢ and under 40¢	10	6.7	2	1.3
40¢ and under 45¢	3	2.0	5	3.3
45¢ and under 50¢	3	2.0		
50¢ and under 55¢				
55¢ and under 60¢				
60¢ and under 65¢	1	0.7		
Total	150	100.0	150	100.0
Average for firm:				
All men	17.4¢		18.0¢	
Men receiving bonus	19.7¢		19.2¢	

With full recognition of the limitations surrounding the data, several conclusions seem justified concerning the significance of base rates in wage comparisons designed to show earning capacity. First, in the selected occupations incentive methods of payment predominate to such a large extent as to establish a presumption against the validity of such rates. Second, no importance can be attached to these

rates on the assumption that earnings are about the same for time and incentive workers, for there is a persistent and appreciable difference in favor of the incentive group. Third, judged by the experience of four firms, not only do most bonus workers actually receive bonuses, but the amounts received are sufficiently large to invalidate comparisons of base rates. Fourth, the experience of a single firm indicates that average bonus payments are substantially the same in a one-week as in a three-week period, although the nature of the distribution differs as between the periods.

Manuscript received April 23, 1931

A Multiple Factor Study of Vocational Interests

By L. L. Thurstone, *University of Chicago*

Is human personality infinitely complex, or, for scientific and practical purposes, resolvable into a limited number of measurable variables? Professor Thurstone here illustrates one way of finding out. By analyzing the intercorrelations of interests of eighteen professions as measured by the Strong schedule, he finds that only four factors are required to account, in the main, for these correlations. This discovery is of great importance both for psychological theory and for personnel practice.

The present study was made on data collected by Professor E. K. Strong of Stanford University on the interests of eighteen professions. Strong has tabulated the interest correlations for all possible pairs of professions. By applying a new multiple factor method to these interest correlations, it has been found that the correlations can be accounted for by assuming four factors, which may be labelled 1) interest in science, 2) interest in language, 3) interest in people, and 4) interest in business. Each profession is described in terms of these four factors. The vocational interests of each person can be described in terms of the same four factors.

THE schedule of vocational interests which was prepared by Professor E. K. Strong has attracted a good deal of attention. It is a systematic attempt to survey and tabulate the interests of students so as to classify them more or less into occupational groups according to their likes and dislikes. This type of analysis is likely to prove of some administrative usefulness in vocational and educational counseling and it is also conceivable that such studies may eventually relate to studies of special abilities in some analytical way.

Professor Strong supplied to the author a list of intercorrelations of the interests of eighteen professions. A high correlation in this list signifies that the two professions so compared are similar in the likes and dislikes which the members of these professions reveal in Professor Strong's schedules. A negative correlation would indicate that the general interests of the two professions are in a certain sense opposite. Inspection of Strong's table of interest correlations for eighteen professions reveals considerable agreement with what might be regarded as general impressions of the professions represented. For example, the interests of lawyers and journalists show a positive correlation of .83 while the

interests of engineers and life insurance agents show a negative correlation of −.72. These and many other coefficients in Strong's table agree with one's impressions of the similarities and dissimilarities of the professions.

The writer has used this table of intercorrelations for studying the possible usefulness of a new method of multiple factor analysis.[1] Since it is not feasible to describe both theory and applications of this new method in the same paper, the theoretical development of the equations has been presented in one paper while the applications are presented here. This is the first application of the method to a set of intercorrelation coefficients.

The problem to which the multiple factor method lends itself can be briefly stated as follows. How many independent and uncorrelated factors is it necessary to postulate in order to account for a given table of intercorrelations? When this has been determined we ask the next question. What is the loading of each of the variables (in this case the eighteen professions) with each of the general factors? When each of the variables has been described in terms of loadings with each of several general factors we naturally try to name these factors. This has been done in the present case, and the factors turn out to be four in number which can be named (1) interest in science, (2) interest in language, (3) interest in people, and (4) interest in business. Each of the eighteen professions is given a numerical loading for each of these interests. Finally, it should be possible to score an interest schedule such as that of Professor Strong for each of the four principal factors instead of separately for each profession. The scoring of such a schedule would then consist in assigning to each individual four scores, one for each of the four principal or general factors. His score for any given profession would then be a weighted sum which depends only on his four general factor scores and the weighting of the profession in question for each of the four factors. In this manner the scoring of schedules of this kind might be very markedly simplified.

In the theoretical paper in which the fundamental equations are developed is also given an outline for the necessary calculations. The present paper will follow that outline and give only the table of correlation coefficients supplied by Strong, the principal summations that correspond to the outline, and the final values of the factor loadings for each of the professions.

In table 1 we have the intercorrelations of the interests of eighteen professions. This table was supplied by Professor Strong. Each of the columns is summed irrespective of sign as required for the selection of the pivot variables. In table 2 we have a summary of the principal summations which are represented by the same

[1] The theoretical paper referred to in this manuscript is entitled "Multiple Factor Analysis," appearing in the September *Psychological Review*. In that paper are developed the fundamental equations for a method of analysing a set of intercorrelations into any number of general factors. The calculations for the study of Strong's table of intercorrelations follow an outline and the notations given in the theoretical paper.

TABLE 1

Correlations of interests of 18 professions. Data from E. K. Strong

		1 Ad	2 R	3 CPA	4 Chem	5 E	6 L	7 M	8 Psy	9 T	10 LI	11 Arch	12 Y	13 F	14 PA	15 J	16 P	17 RE	18 D
1	Ad	1.000	.289	.202	−.563	−.576	.693	−.068	−.161	−.399	.433	−.124	−.151	−.647	−.354	.795	−.206	.576	−.132
2	R	.289	1.000	.000	.312	.262	.350	.326	.661	.102	−.424	.741	−.364	−.021	−.691	.554	−.580	−.387	.155
3	CPA	.202	.000	1.000	−.049	−.036	.479	.127	.121	.061	.038	−.074	−.085	−.312	.057	.327	.088	.064	−.013
4	Chem	−.563	.312	−.049	1.000	.875	−.370	−.039	.720	.214	−.876	.676	−.401	.628	.356	−.308	−.221	−.782	.677
5	E	−.576	.262	−.036	.875	1.000	−.387	−.300	.438	−.010	−.723	.565	−.464	.760	.281	−.387	−.167	−.540	.534
6	L	.693	.350	.479	−.370	−.387	1.000	.103	.064	−.111	.306	−.087	−.166	−.474	−.412	.826	−.190	.352	.139
7	M	−.068	.326	.127	−.039	−.300	.103	1.000	.379	.779	−.037	.093	.602	−.297	−.555	.075	.283	−.409	.143
8	Psy	−.161	.661	.121	.720	.438	.064	.379	1.000	.471	−.785	.692	−.214	.160	−.574	.159	−.263	−.793	.714
9	T	−.399	.102	.061	.214	−.010	−.111	.779	.471	1.000	−.233	.137	.611	.296	−.329	−.193	.397	−.584	.109
10	LI	.433	−.424	.038	−.876	−.723	.306	−.037	−.785	−.233	1.000	−.662	.382	−.466	.217	.148	.264	.854	−.612
11	Arch	−.124	.741	−.074	.676	.565	−.087	.093	.692	.137	−.662	1.000	.377	.398	−.313	.086	−.390	−.564	.714
12	Y	−.151	−.364	−.085	−.401	−.464	−.166	.602	−.214	.611	.382	.377	1.000	−.279	−.027	−.274	.723	.031	−.510
13	F	−.647	−.021	−.312	.628	.760	−.474	−.297	.160	.296	−.466	.398	−.279	1.000	.347	−.478	−.160	−.368	.407
14	PA	−.354	−.691	.057	.356	.281	−.412	−.555	−.574	−.329	.217	−.313	−.027	.347	1.000	−.527	.300	.320	−.369
15	J	.795	.554	.327	−.308	−.387	.826	.075	.159	−.193	.148	.086	−.274	−.478	−.527	1.000	−.404	.236	.234
16	P	−.206	−.580	.088	−.221	−.167	−.190	.283	−.263	.397	.264	−.390	.723	−.160	.300	−.404	1.000	.067	−.577
17	RE	.576	−.387	.064	−.782	−.540	.352	−.409	−.793	−.584	.854	−.564	.031	−.368	.320	.236	.067	1.000	−.538
18	D	−.132	.155	−.013	.677	.534	.139	.143	.714	.109	−.612	.714	−.510	.407	−.369	.234	−.577	−.538	1.000
Totals.....		7.369	7.219	3.133	9.067	8.305	6.509	5.615	8.369	6.036	8.460	7.693	6.661	7.498	7.029	7.011	6.280	8.465	7.577

TABLE 2

The following determinations are summarized from the calculations by which Professor Strong's table of interest correlations were analyzed by a multiple factor method. The values and notation correspond to an outline described in the writer's paper, "Multiple Factor Analysis," Psychological Review, September, 1931.

Variable a	= chemistry
Subgroup s	= *R, Chem, E, Psy, T, Arch, F, PA, D*
Σs_1	= $\sqrt{\Sigma r_{ss}}$ = +5.58
Variable b	= *R*
Subgroup t	= *Ad, R, Chem, E, L, M, Psy, T, Arch, J, D*
Σt_2	= +4.16
Variable c	= *Y*
Subgroup u	= *M, T, Li, Arch, Y, P, RE*
Σu_3	= +3.38
Variable d	= *L*
Subgroup v	= *Ad, R, C, PA, L, M, Psy, Li, J, RE, D*
Σv_4	= +1.54

TABLE 3

CODE NUMBER OF PROFESSION	STRONG'S NOTATION	NAME OF PROFESSION	FOUR INTEREST FACTORS				SUM OF SQUARES OF LOADINGS	RANK ORDER
			I Science x_1	II Language x_2	III People x_3	IV Business x_4		
1	Ad	Advertising	−.48	+.66	−.21	+.22	.76	13
2	R	Art	+.45	+.70	−.18	−.31	.82	10
3	CPA	Certified Public Accountant	−.04	+.32	.00	+.56	.42	18
4	Chem	Chemistry	+.98	−.21	−.15	+.06	1.03	3
5	E	Engineering	+.84	−.36	−.22	+.16	.91	6
6	L	Law	−.23	+.77	−.12	+.44	.85	9
7	M	Ministry	+.09	+.51	+.62	−.30	.74	14
8	Psy	Psychology	+.77	+.47	−.04	−.28	.89	7
9	T	Teaching	+.36	+.15	+.68	−.22	.66	16
10	LI	Life Insurance	−.82	−.02	+.27	+.45	.95	4
11	Arch	Architecture	+.83	+.26	+.16	+.05	.78	12
12	Y	Y. M. C. A. Secretary	−.23	.00	+.90	−.37	1.00	1
13	F	Farming	+.71	−.54	+.01	+.18	.83	2
14	PA	Purchasing Agent	−.05	−.79	+.01	+.44	.82	11
15	J	Jouralism	−.15	+.84	−.28	+.25	.87	8
16	P	Personnel	−.30	−.26	+.66	−.19	.63	17
17	RE	Real Estate	−.76	−.07	−.06	+.58	.92	5
18	D	Medicine	+.71	+.33	−.26	−.09	.69	15

The names that have been assigned to the four factors are tentative. They are based on inspection of the loadings above.

notation as in the outline. These are presented so as to facilitate checking the calculations in case some reader should care to repeat the process.

Table 3 shows the final loadings. The interpretation of the table is as follows. The first column gives the code number of the variable by which

it is identified throughout the calculations. The second column gives Strong's abbreviation for each profession. The third column gives the more complete name of the profession. It should be noted that the item "Farming" refers to students of agriculture. The next four columns show the loadings which constitute our objective. For example, the profession of engineering has a loading of +.84 for the first factor, −.36 for the second factor, −.22 for the third factor, and +.16 for the fourth factor. These factor loadings have a maximum range of from −1 to +1. A zero loading means that the profession is not distinguished by either like or dislike for the factor in question.

The fourth column of the table gives the sum of the squares of the four loadings. Theoretically, this sum should be unity if the variable is entirely accounted for by the four factors.[2] It is readily seen that some professions are much more completely described by the four factors than some others. For example, the professions that are quite satisfactorily described by the four factors are art, chemistry, engineering, law, psychology, life insurance agent, Y. M. C. A. secretary, journalism, and real estate selling. The most conspicuous discrepancy is found for the certified public accountants. Their interests correlate low with all of the other professions according to the original data and it was therefore difficult to tie them in, as it were, with any of the factors that are operative for the remaining professions. These summations do indicate, however, to what extent the variable in question is described by the four factors and the extent to which the variable must be described by additional factors. This summation of the squares of the loadings is therefore sometimes of considerable significance.

The last column gives merely the rank order of the professions according to the extent to which the four factors describe them. First rank is given to the most completely determined variable.

After having assigned a factor loading to each of the eighteen professions it is of course of some interest to name the factors if possible. This matter of naming the factors is entirely extraneous to the statistical analysis. The statistical work may be correct while considerable argument might conceivably be made about the naming of the factors. In naming the factors we proceed as follows. We inspect the column of first factor loadings with reference to the positive values. We find then that the first factor has high positive loadings in the following professions, namely, chemistry, engineering, psychology, architecture, agriculture, and medicine. We also find that the following professions have strong negative loadings (dislike) for the first factor, namely, advertising life insurance selling, real estate selling. It seemed to the writer that scientific interest is probably a factor that would differentiate the above professions in the manner shown. Therefore the first factor is called tentatively an interest in science.

[2] An adjustment was found necessary in the loadings for variable number 13, agriculture, because of an inconsistency in one of the coefficients involving this variable.

In the same manner the high positive loadings for the second factor are seen in table 3 to be the following: advertising, art, law, ministry, journalism. One might guess that these professions are characterized more or less by interest in talk. We then inspect the strong negative loadings to ascertain whether such a guess makes sense. We find then the following with negative loadings: engineering, agriculture, purchasing agent. These professions are certainly not conspicuous for talking and they might be thought of as rather disliking it on the whole. We therefore name the second factor an interest in language.

The other factors are named in the same manner. The third factor is named an interest in people because the high positive loadings are found for ministry, teaching, Y. M. C. A. secretary, and personnel men. These people are supposed to be interested in people. Some one has commented that the psychologists should be in this list but the writer believes that the zero rating of psychologists as regards their interest in people is correct because, as a class, psychologists are not usually genuinely interested in people.

It should be pointed out that when multiple factor analysis is undertaken, there is absolutely no guarantee that the resulting factor loadings will so arrange themselves that they can be readily named. This may be due to the fact that the axes may be so located as to cut between the axes that are implied in one's general understanding of the variables involved. Also, the factors may be new and hitherto unknown. In the mathematical sense there is an $(n-1)$ infinity of solutions to the problem of multiple factor analysis in which n is the number of factors postulated. But the procedure which has been recommended in the theoretical paper gives a single solution on the assumption that the factors that are important are likely to be found strongly represented in the variables studied. A unique solution to the problem of multiple factor analysis is not possible in the mathematical sense unless one restricts the problem further in some manner such as by specifying that the loadings shall be either unity or zero or in some other way.

Even if, in some particular study, it should turn out to be difficult to name the general factors that have been isolated, it is still of considerable interest to know how many factors it is necessary to postulate in order to account for the given intercorrelations within any specified degree of experimental error. The fact that we can account for the 153 intercorrelations between eighteen variables by postulating only four factors with a fair agreement throws light on a psychological question that has frequently been raised. This psychological question concerns the number of special abilities or special traits by which psychology will eventually be able to describe people. It has been the impression that a great number of special abilities must be isolated before adequate description is possible. The present study in which the interests of eighteen professions can be fairly well accounted for by postulating only four general factors indicates, it seems to the writer, that our problem

is not quite so complex as we have thought. It is probable that there is more overlapping in the traits represented by the adjectives of a dictionary than we have supposed. The number of special abilities that must be isolated before vocational counseling can be undertaken is probably smaller than has been estimated. This is encouraging even if we allow that a really complete description of each personality would require the consideration of many minor traits which are not sufficiently universal to warrant inclusion in our first analyses of personality variables.

In order to ascertain how closely the factor loadings do account for the original correlation coefficients we have calculated the correlation between the interests of each profession with those of every other profession in terms of the factor loadings only. This leads to another table similar to table 1 in which all coefficients are calculated from the factor loadings. The discrepancy between the original coefficient in Strong's table and the coefficient so calculated has been tabulated. The frequency distribution of these discrepancies is shown in figure 1. The great majority of the discrepancies are small but a few discrepancies are as large as .3. The mean value of all the discrepancies is 0.012 and the standard deviation of the distribution is 0.098. This means that two-thirds of the discrepancies between the given coefficients and the calculated coefficients are less than 0.10. This comparison of the given and the calculated coefficients should be made in terms of the magnitude of the chance errors in the given coefficients. The average

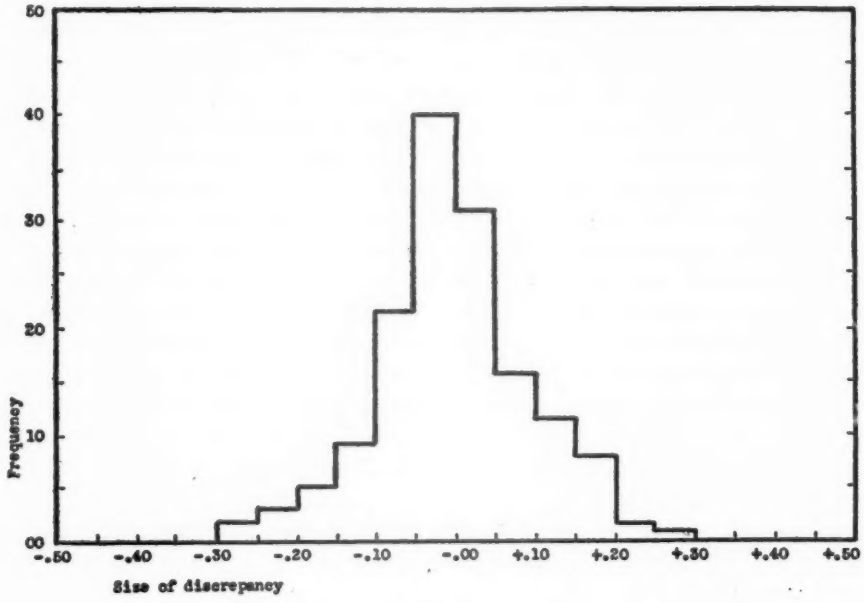


FIG. 1

size of the coefficients in the given table is .40 and the population was 287. Hence the standard error of the average coefficient in the given table is about .05. Therefore the standard deviation of the discrepancies between pairs of such coefficients should be expected to be in the vicinity of .07. Instead of such a value we get a larger one, namely .10. This larger discrepancy is due to the fact that we have postulated only four factors and by so doing we are undoubtedly ignoring factors of minor significance or factors that are of significance in a relatively small number of variables in our table. By ignoring them we undoubtedly introduce errors which might be expected to make large discrepancies in some of the variables. The above comparison shows a fairly satisfactory agreement between the given correlation coefficients and the computed coefficients, in fact a much closer agreement than the writer had expected with four general factors.

It is possible to make an estimate of number of factors that are operative in a table of coefficients without making the rather laborious calculations for the factor loadings. Such an estimate can be made by inspection of the original coefficients. The method for doing this is also described in the outline above referred to.

In scoring the Strong interest schedule it would be possible to assign four factor scores to each person and to estimate his score in each of the professions by a simple summation in which each of his factor scores is multiplied by the weight of that factor in the profession. In this manner it would be possible to construct a profile of professional interests for any one person on the basis of the four factor scores that have been assigned to him. It is hoped, however, that the methods of multiple factor analysis may be useful not only in producing labor saving office devices for scoring but also in the more important scientific problems that require the analysis of complex phenomena into the smaller number of essentials that are operative to produce them.

Manuscript received April 14, 1931

News Notes

TENTH ANNIVERSARY MEETING OF THE PERSONNEL RESEARCH FEDERATION

The Annual Fall Conference of the Personnel Research Federation to be held at the new Waldorf Astoria in New York on Thursday and Friday, November 12th and 13th, will celebrate the tenth anniversary of the establishment of the Federation. Some of the papers and addresses will appraise the progress that has been made during the past decade through personnel research, in securing more dependable knowledge about occupational opportunities in industry, business and the professions, and in inventing and validating improved means of ascertaining a person's abilities, aptitudes, interests, and personality, in relation to these opportunities.

The general outlook of the program will, however, be toward problems of the present and the future rather than the past. For example, what industries, occupations and professions are on the down grade, furnishing a diminishing number of jobs, and which are on the make, requiring more workers in future years than before the depression set in? Comparisons of data from the censuses of 1920 and 1930 have significance in this connection. Certain communities are undertaking to dig up these facts locally for their own industrial planning with a view to stabilization of employment and improvement of the labor market machinery. One paper, on earnings and trends in the learned professions, is certain to stimulate serious reflection.

In planning for the occupational readjustment of those now unemployed or to be unemployed, it is important to have access to the latest authoritative findings not only about relative demand and supply in different occupations, but also about the best ways of specifying the precise nature and requirements of jobs and occupations, and the most reliable and practicable ways of helping a man discover whether he has the abilities or aptitudes necessary for success in these occupations. Several industries, research bureaus, state commissions and individual investigators have recently been making studies bearing on these subjects of the forecasting of occupational demand, the preparation of useful occupational descriptions or personnel specifications, and the techniques of individual appraisal. There will also be opportunity to hear what has been learned recently about mobility of trained workers and the best ways of reeducation of skilled workers whose occupations have vanished.

It seems probable that for some years after the swing of the business cycle restores prosperity, there will still be large numbers of unemployed, since in many industrial areas the population had for some time before 1929 been growing faster than the number of jobs. In several cities, serious efforts are being made to study this problem and the best ways of meeting it through "made" work, part-time work, and staggering employment, or through adoption of a shorter working week, or shorter day, or elimination of child labor, or earlier retirement of older workers. A session will be devoted to reports of what is being done to study these problems systematically.

Related to this subject is the question as to what types of labor exchanges will be adequate to serve the workers, the employers and the communities during the next few years. Descriptions of model labor exchanges will be presented.

Definite progress has been made recently in some of the colleges and schools as well as in placement bureaus and employment offices, in the process of educational and vocational counseling, and in the ways of training counselors for their work. One session will be devoted to this field, with a report of the Stevens Institute of Technology ex-

periment in vocational guidance of high school boys conducted this summer at their engineering camp; the work of the Vocational Service for Juniors in providing a year's apprenticeship in counseling; the Blue Ridge experiment in combining a seminar on interviewing with actual experience in counseling college men; and possibly two or three other significant undertakings directed toward the same end. The time has arrived for a clear-cut appraisal of the best available techniques and procedures in interviewing, testing, rating, supplying opportunities for vocational tryout, and otherwise helping young people to make progress in self-understanding in relation to their life objectives and immediate educational decisions. Among the speakers who will contribute to this session are President Harvey N. Davis, Owen E. Pence, M. S. Viteles and Mary H. S. Hayes.

The speakers at the dinner meeting will maintain the high standard set in previous years. The detailed program for all the sessions and round-tables will appear in the November number of the Personnel Service Bulletin.

UNITED STATES CIVIL SERVICE COMMISSION

The Annual Report of the Director of Research, United States Civil Service Commission, for the fiscal year ending June 30, 1930 described important advances in the administration and technique of selecting applicants for governmental service. Of the many improvements may be cited the development of the new stenographer-typist examination, which yields a correlation of +0.76 with efficiency; and a new and simplified application form which is found to be filled out completely and correctly by 68 per cent of applicants as compared with 4 per cent for the older, more cumbersome form.

Dr. L. J. O'Rourke, President of the Personnel Research Federation, is Director of Research.

TEACHING INDUSTRIAL RELATIONS

A report has been privately published of an informal conference on "Teaching Engineering and Business Students to Deal with Men and Manage Industrial Relations" held at the home of Sam A. Lewisohn, March 28, 1931, in coöperation with the Society for the Promotion of Engineering Education. The discussion covered content of courses in human relations and methods of teaching human relations as well as the objectives of teaching human relations. The pamphlet includes description of a case demonstration presented by students of Professor Elliott D. Smith and sample case problems submitted by Professor Herman Feldman and Professor Erwin H. Schell. Copies of the pamphlet may be secured by addressing Mr. Sam A. Lewisohn, 61 Broadway, New York.

INDUSTRIAL HEALTH RESEARCH BOARD

The Eleventh Annual Report of the Industrial Health Research Board (Great Britain) describes research done by that organization during the past year, and in addition gives a detailed analysis of the work done during the preceding five years.

Among the specific problems attacked and reported on in the last year are the following: physiology of heating and ventilation; effect of ultra violet radiation on workers; effect of noise and vibration on efficiency; psychological factors involved in accident proneness; effects of incentives; occupational fitness of mental defectives; and causes of absenteeism among coal miners.

INDUSTRIAL RELATIONS IN 1930

According to *Information Service*, there were in 1930 fewer strikes and lockouts than in any year since 1916 with the exception of 1928. There were 629 in 1928, 903 in 1929 and 653 in 1930. The total number of workers involved during these three years were 357,145, 230,463 and 158,114 respectively. Thus it is evident that although the number of disputes in 1929 was greater by 274 than in 1928, the total number of workers involved has steadily decreased. These data present a decided contrast to those for the depression of 1920–22, when the total number of disputes ranged from 3,411 in 1920 to 1,112 in 1922.

VOCATIONAL AND EDUCATIONAL GUIDANCE AS A PROFESSIONAL CAREER

A brief pamphlet on *Vocational and Educational Guidance as a Professional Career* is available on application to the Graduate School of Education, Harvard University. It describes the work of a counselor, the various types of positions available, qualifications needed, and then outlines courses of training with special reference to those offered by Harvard.

GUIDANCE AT OHIO WESLEYAN

C. O. Mathews of Ohio Wesleyan University has prepared a mimeographed bibliography of 90 books and articles on vocational information and guidance for use by students of that university. The readings are classified by authors, and in addition, by vocations, forty-six of which are included.

Personnel Books

EDITED BY O. MILTON HALL

HOW TO INTERVIEW

By Walter Van Dyke Bingham and Bruce Victor Moore. New York: Harper, 1931, xv + 320 pp., $4.00

Reviewed by GLENN A. BOWERS

The zone between the art and the science of human communication has misty boundaries. Talking, writing, and "wig-wagging" may be aimless habits or they may serve as media for getting useful things done. Conversations between individuals or among members of a group, like essays, books, or other forms of literature, have varying aesthetic values. On the other hand they may be directed toward the utilitarian ends of social adjustment and economic life. Without implying that utilitarian ends cannot be pursued in an artistic manner, perhaps the art of communication is be observed mainly in the quality of its aesthetic values, and the science of communication mainly in its effectiveness as a practical tool for social and business activity. The subject of this book *How to Interview* lies in the latter field.

The authors have designated an interview as "a conversation with a purpose" and have presented the results of their extended study in the form of practical psychology for use by persons whose work involves talks with others. "This volume is addressed to interviewers, and also to those who utilize the information which interviewers gather," specifically, employment managers, industrial investigators, physicians and psychiatrists, lawyers, police inquisitors, salesmen, journalists, teachers, vocational counselors, and social workers.

Here is a report of findings reached through the skilled use of social science research. The goal was the discovery of effective methods for pursuing *the purpose* of the interview. Once the more effective methods are distinguished from those which are less effective, there is the possibility of prediction of results. Since predictability is the prime requisite of science, there appears the possibility of a science of interviewing.

No sane person would hope for conversations, even those with a purpose, to be reduced to formulae. Yet even the man most skeptical of rules for interviewing will admit that he usually does "thus or so" in a given situation. The problem therefore encountered by the present investigators was the recording of ways in which successful and unsuccessful interviewers acted under typical circumstances. Having identified these, they have drawn some conclusions about interviewing which may not seem to be "news" to everyone but which will surely be helpful to beginners and to that vast hordes of persons who waste the time and tax the patience of others in rambling and disorganized interviews.

For the specialized users of the interview, valuable suggestions as to method are contained in the chapters on the vocational interview, the employment interview, the industrial relations interview, the interview in marketing studies and commercial surveys, the interview in social case work, in education, in the mental clinic, in journalism, and in legal questioning. Many illustrations are given and several detailed case studies are presented so that one does not want for pertinent examples in his own field of the outlined techniques of interviewing.

In the area of general conclusions, the

interview is "most dependable as a means for obtaining facts about the interviewee's own attitudes and emotional reactions." "Contrary to common assumption, the interview, skilfully used, has its greatest value in ascertaining knowledge, not about external physical facts and events but about an interviewee's attitudes and feelings." Precaution is urged "against depending upon the interview for facts obtainable from records, minutes, direct observation, controlled experiment, or other sources not subject to distortion through personal influences. When such sources exist, the function of the interview is to uncover them, to secure access to them, and to aid in understanding and interpreting them."

Except where the interviewer is observing certain characteristics of the interviewee himself, the investigator must so shape his inquiry "that it will harmonize with the interests of the person he interviews. There must be a real community of purpose. The truth which the interviewer wants, the interviewee, too, must want."

Perhaps the rarest accomplishment of an interviewer is the ability to listen—to be "more interested in what his questions may uncover in the way of truth than in any preconceived hypothesis of his own." . . . . "Not the external conditions, not the denseness or the perversity of the interviewee, but the interviewer himself is chiefly responsible for lack of reliability in fact-finding."

This pioneering study has sorted out a number of valuable principles, specific as well as general, which may serve as foundations for other researches, either for verification or refinement. At the same time it provides a body of workable rules for the guidance of those who may be encountering perhaps daily the difficulties of fact-finding through interviews.

This book is a significant milestone in the development of the science of human behavior.

THE DISSATISFIED WORKER

By V. E. Fisher and J. V. Hanna. New York: Macmillan, 1931, ix + 260 pp., $2.50

Reviewed by O. L. Harvey

The need for the application of the principles of abnormal psychology to industrial situations is too obvious to warrant repetition. Yet, so far as the reviewer knows, there are only two texts, clearly written and practical, which deliberately serve just this end. Anderson's *Psychiatry in Industry* is one; this is the other.

Although much has been done to improve the methods of vocational selection and placement, and to develop, at least superficially, a cordial relationship between management and individual worker, little or nothing has been effected in the adjustment of the worker to his job by correcting his emotional attitude to life as a whole. Nevertheless, experience shows that much apparent vocational misfitting is attributable to just this emotional maladjustment, the roots of which lie buried in the background of the individual's personal and social history. The need for, and value of, psychotherapy in industry is what the authors seek to demonstrate.

Briefly but clearly they discuss the nature of human motivation. Their classification of emotions appears to follow McDougall's; their explanation of them, however, is made predominantly on the basis not of instincts but of conditioning. The principal varieties of emotional maldevelopment, according to the authors, are those relating to self-assertion, fear, and "the sexual disposition," —a seemingly somewhat Freudian schema. The explanation of these disturbances, however, in no way savors of any "school" of analysis.

Fairly considerable emphasis is placed upon the great financial loss, seldom recognized by industry, which is involved in the employment and retention of emotionally maladjusted workers. Rehabilitation rather than dismissal is, however, recommended. Ways of diagnosing cases in need

of mental hygiene treatment are described; and a simple mental hygiene department, appropriate to a typical business organization, is outlined.

It was perhaps inevitable that this interesting and useful volume should contain little that is essentially different from what is already available in the senior author's earlier text in abnormal psychology. After all, the principles of abnormal psychology are the same, whether in the class-room or in the industrial clinic. What the present test does, however, is to make these principles available to those who probably do not, yet most need to, know them—namely, the dissatisfied workers themselves, and those who have charge over them.

The reviewer feels that the authors have dealt with their subject sanely and consistently. Probably the best part of the book is the firm, educative treatment and evaluation of sexual maldevelopment. To one personally experienced in many different occupations, the significance of this phenomenon cannot escape notice. One cannot help but feel that the authors have restrained themselves with difficulty from giving this portion of their text more space.

There is an excellent index, but no selected biblography—a lack which is to be regretted.

CASE STUDIES OF UNEMPLOYMENT

Compiled by National Federation of Settlements with an introduction by Helen Hall. Philadelphia: University of Pennsylvania Press, 1931, xlv + 413 pp., $3.00

Reviewed by NELSON A. VOORHEES, *New York State Education Department*

Publication of *Case Studies of Unemployment* at the present time is opportune. Interest in the problem of unemployment and the search for a solution of the problem undoubtedly will cause a wider reading of the book than if it were published at any other time. The fact that the case studies reported deal with the period before the "break" in the Fall of 1929, increases rather than lessens the value of the study.

Case histories are given of one hundred and fifty families, a total of over nine hundred individuals. Seasonality of occupation, mechanization of industry and the technological changes in production, market and style changes, and business depression all contribute as causes of unemployment. Business depression is clearly the major cause, accounting for approximately one-half the cases. These case studies present a cross-section of conditions of employment during a normal period, which only need to be increased in numbers to be equally representative of a period of depression.

In her introduction, Miss Hall has divided the results of unemployment in these cases into their economic, physical and psychological effects. Economically, there is broken income, expenditure of savings, lapse of insurance, loss of possessions, and finally a lowered standard of living with charitable relief. Physically, lessened food, inadequate clothing, and unsuitable living conditions result in mal-nutrition and disease. Psychologically, discouragement and anxiety follow inevitably from the lack of work. There is cruelty, desertion, lowered morale, loss of self-respect, and humiliation at receiving relief, with every likelihood of the crop of mental mal-adjustments and other forms of social failure increasing during the present generation.

To the case worker, a greater amount of detail than is given in the résumé might be desirable. For others, the numerous repetitions of like circumstances of failure do no more than present an adequate picture. Solution of the problem presented suggests the need of better personnel organization on the part of those who provide employment, as well as the need of some form of social insurance against want for those who seek work but cannot find it.

THE PSYCHOLOGY OF THE INVENTOR

By Joseph Rossman. Washington: Inventors Publishing Co., viii + 252 pp., $3.00

Reviewed by HARRY D. KITSON, *Columbia University*

This book, written by a patent examiner in the United States Patent Office, contains many facts which will strike the reader as novel and interesting. For many of them the author applied directly to inventors themselves and to persons closely in touch with them, such as patent attorneys and directors of industrial research. He outlines the mental processes of invention as described in standard books on psychology, and illustrates the steps by quoting from the testimony of inventors.

His list of the mental traits belonging to inventors is open to question, for he simply asked the three classes of correspondents what they thought were the characteristics concerned. The replies, as might be expected, were couched in terms of originality, imagination, perseverance, observation, analytic ability, etc. But the three classes of correspondents do not agree as to the order of importance in which to place these traits nor do they mention the same traits throughout. Surprisingly enough, "mechanical ability" is placed last!

The questions on the author's questionnaire which called for factual answers give a more reliable basis for psychologizing. From these we find that inventors work for the sheer love of inventing; that their chief obstacle is lack of money; that almost half of their inventions do not relate to their daily occupation; that the occupation most frequently represented is that of engineer. With reference to the rôle played by "inspiration," the inventors report, as a psychologist might expect, that their bright ideas come in sudden flashes, but that they are preceded by long periods of incubation during which the inventor has been thinking about the subject from every angle. One correspondent reports that his "inspirations" always come while he is taking his morning bath.

Subsidiary topics with which the volume deals are indicated by these chapter headings: Chance and Accident in Invention, Heredity and Invention, Training Inventors, Psychology of the Patent Law, Psychological Theories of Invention.

The book will naturally make its strongest appeal to inventors who possess some curiosity concerning their own mental processes, and to patent lawyers and technical experts who have to deal with inventors. But it will be interesting also to intelligent lay readers, who will find in it vivid descriptions of the way in which many conveniences and necessities of modern life come into existence.

WORLD WORKERS' EDUCATIONAL MOVEMENTS

By Marius Hansome. New York: Columbia Univ. Press, 1931, 594 pp., $5.00

Reviewed by ALLEN B. GATES, *Eastman Kodak Company*

In preparing this book, Dr. Hansome collected a great mass of material from all parts of the world and from a multitude of educational institutions, workers' educational associations, trade unions, and political groups. The reports from these various sources supplemented by personal interviews and material collected by a comprehensive survey and his experience as a student and teacher of social science form the basis for his treatment of the subject.

The study is so comprehensive, and compiled information so valuable, that to the author's list of groups for which the material should have an appeal, he might add industrial managers. And most certainly the book should be of interest to those industrial executives who are endeavoring to

formulate and carry out plans which will give to the industrial worker every possible opportunity to enlarge his possibilities for service and thereby improve his personal well-being.

In part I a brief historical sketch of workers' education is followed by a short but comprehensive discussion of the general character of world workers' education. In part II the author has treated the subject from the angle of each of the major purposes of the workers' educational movement—cooperation, trade union, political, and cultural. He has shown how each purpose has been considered in nearly every workers' educational movement but that each group has emphasized those subjects which it feels will bring forth the results which it is seeking. A careful review of these studies from each of the various angles, reveals that, regardless of the nationality of the group carrying on the work, the curricula have much in common. It is, however, also apparent that local and national social conditions have had much to do with the shaping of adult and workers' educational programs.

As is characteristic of many students of social problems, the author seems to ignore these differences except to point out occasionally that such differences do exist. He points out that the workers' educational movement in England is more conservative than the movement in other parts of Europe without drawing attention to the differences between the English and other nationalities that have influenced, in many cases for the better, other phases of social and political relations.

One might be lead to believe also that the American Federation of Labor is not active enough in fostering workers' education because of the proportionately small number of workers' classes conducted by labor organizations in this country. The author does not call to the reader's attention the part played by organized labor in shaping our public education program through cooperation with departments of education and with industry. Neither does he call attention to the fact that nowhere in the world has compulsory lower education and popularized higher education been as well worked out as is generally the case in the United States of America. In addition to making education compulsory for the younger generation and placing higher education within the reach of both rich and poor regardless of occupation, the multitude of University extension courses, correspondence courses, and night schools have helped to make the workers' educational movement less necessary in America than has been, and probably still is, the case in some other parts of the world.

In his chapter "Problems of Workers' Education," Dr. Hansome says the slogan to hold up before our young people ought to read, "Go to school so as to learn to work creatively and thereby acquire the art of significant living." To this all should subscribe but why should not the educational fraternity and especially that section dealing with the social sciences adopt a leaf from progressive American industrial management and inoculate American youth with the broader idea, "Go to school so that you may learn to serve your community which may be your village, your metropolitan city, your nation, or your world." This is in line with the desire to create in the mind of each individual a sense of personal interestin the well-being of the people of all nations and could be taught to all youth without the necessity of planting seeds of class hatred.

Progressive industrial management is trying to establish this idea of service through its industrial training programs. These programs are as much a part of adult workers' education as are any of those covered in Dr. Hansome's study but not a single reference is made to them in his report. I refer to them because they are an important part of the difference between the conditions in America and in most other parts of the world.

Although, as one is apparently expected to infer from the author's presentation, that the way to a socially-minded people is necessarily through the establishment of a class-minded people, there is much in the treatment partly printed and partly between the lines that tends to prove that the American experiment now well under way has proved more successful. This fact is amply proved by the higher standards of living, learning, and being in America than in most other parts of the world.

Industrial managers, personnel men, and especially those interested in industrial training, which in this country is an important part of adult education, can well afford to study with extreme care, and in as open-minded a manner as possible, Dr. Hansom's treatment of the World Workers' Educational Movements. Much can be found therein to help them chart their course so that the good work that has been done in these fields can be improved and amplified and so that the unnecessarily biased teachings of those who feel that conditions can be improved only through the establishment of class consciousness with the great possibility of class hatred, can be at least partially counteracted. We must have liberality in our education and industrial management must be liberal if it is to be successful. It is not necessary, however, to tear down what we have and accept a substitute which has produced nothing that can compare with the results obtained by the American method for the social and economic well-being of the American workmen.

Briefer Mention

REDUCING SEASONAL UNEMPLOYMENT. By Edwin S. Smith. New York: McGraw-Hill, 1931, xvii + 296 pp., $3.00.

This is a valuable record of the recent experience of American manufacturers with methods of ironing out seasonal demands for labor and assuring stable employment. Problems of seasonal demand, sales and production budgeting, special selling efforts, internal personnel policies of transfer and training, are among those treated. The conclusions are practical and encouraging. The book deserves a wide audience among executives. It reduces nebulous ideas of "economic planning" to concrete terms that every company can use to advantage.

ECONOMIC PROBLEMS OF MODERN LIFE. By S. Howard Patterson and Karl W. H. Scholz. New York: McGraw-Hill, 1931, 695 pp., $3.75.

This is a revised edition of the book with the same name published in 1927. Its general purpose is the same and it is given the same treatment as the first edition. The principal changes consist of a somewhat different order of development, the inclusion of recent facts and figures, and the addition of a section on Land Economics. It will still find its chief usefulness as a text in elementary economics either as the basic text for a course in descriptive or problem economics, or in conjunction with one of the standard works on the principles of economics.

THE INSECURITY OF INDUSTRY. Edited by E. M. Patterson. *Annals of the American Academy of Political and Social Science*, vol. 154, March, 1931, 210 pp., $2.00.

This issue of *The Annals* follows its predecessors in being devoted to a single timely subject. Most of the articles in this number are reprints of papers on the problem of industrial security read at the December conference of the American Academy of Political and Social Science. There are 12 articles on the general unemployment situation and 17 on programs for the stabilization of employment.

STABILITY OF EMPLOYMENT. Compiled by Julia E. Johnson. New York: Wilson, 1931, 206 pp., $.90.

This is another number in the series of reference books designed primarily for high school and college debaters. The book contains briefs, bibliography, and selected articles. The 22-page bibliography will be found to be the most useful feature. The briefs are suggestive of leading thought on the pros and cons of this question. Extended quotations are made from twenty-four important articles on unemployment with brief excerpts from numerous others.

THE ECONOMIC LIFE OF SOVIET RUSSIA. By Calvin B. Hoover. New York: Macmillan, 1931, $3.00.

This is in many respects the most accurate and comprehensive of the recent descrip-

tions of the Russian experiment. Professor Hoover has covered a wide range of topics, from money and banking and the new economic policy to the problems of labor and trade unions. Russia suffers less from unemployment than any other large nation at present, and her efforts to train and place workers in the most effective positions are worthy of study. Upon the efficiency of labor will depend much of the success of the Five Year Plan and the ability of Russia to compete with other countries.

THE MONEY ILLUSION. By Irving Fisher. New York: Adelphi, 1930, xv + 245 pp., $2.00.

Professor Fisher has put into popular and readable form the ideas which he has been expounding for many years, regarding money and the importance of controlling it in the interest of society. As an advocate of the so-called "Quantity Theory," he believes that the level of prices is dependent upon the amount of money and bank credit available for making payment. If the volume of money and bank credit is kept relatively stable, the price level will remain so, and the evils of depression, unemployment and their train may be avoided.

DEPARTMENT STORES; RECENT POLICIES, COSTS, and PROFITS. By Boris Emmet. Stanford Univ., 1930, xxii + 214 pp., $4.00.

Professor Emmet has divided his book into three parts and an appendix. Part One, called "Present Conditions," is a critical analysis of department store management. Without any hesitation, he gives the reasons why department stores have not made a better showing in recent years. The relationship between the store and customer —gilt-edge service, easy credit, high customer returns—accounts for a part of the difficulty. Inefficient and unscientific management, unrestricted competition, overorganization, and store modernization extremes are maladies from which he sees stores suffering.

In Part Two, "Trends 1922–1929" are discussed. Numerous tables and charts from authoritative sources point to changes in cost of merchandise, returns and allowances, collections, merchandise turnover, and net profit in department stores during these years.

In Part Three, figures are given for departments for the same period. An interesting feature of the Appendix is the organization and activities of the National Retail Dry Goods Association.

The compilation of statistical information well illustrated by tables and charts makes this book valuable. It is stimulating and challenging, but, in view of the forceful manner in which the author describes problems of department store management, it falls short in its lack of remedies for many of the afflictions which he has described.

RECORDING AND REPORTING FOR CHILD GUIDANCE CLINICS. By Mary Augusta Clark. New York: Commonwealth Fund, 1930. xi plus 151 pp., $2.00.

This is a handbook for the service bookkeeping of a child guidance clinic. It reproduces and discusses the forms and procedures for keeping records and preparing reports developed in connection with the administration of the Demonstration Clinics in Child Guidance and Mental Hygiene set up under the Commonwealth Fund. The forms include an application blank, a daily appointment schedule, a daily-monthly tally and report card, an administrative card, a case data card, a service summary card, and a monthly service report form. They have been developed primarily to facilitate the routing of cases and the monthly compilation of service reports, numerical statements of the services rendered by the clinic. Printed copies of certain of the forms may be purchased from the Commonwealth Fund.

PERSONALITY AND INTELLIGENCE. By Janet Fowler Nelson. New York: Teachers College, 1931, 62 pp., $1.50.

A study of the behavior of 102 three-year-old children during the administration of the Kuhlmann-Binet and Merrill-Palmer tests is described. A standardized method of measuring personality reactions in terms of frequency of appearance was developed. Resistance to the tests, spontaneous activity and conversation, initiative and persistence were recorded. Resistance was negatively

correlated with M.A. The traits other than resistance were positively interrelated. A slight M.A. difference was in favor of the girls.

J. C. PENNEY, THE MAN WITH A THOUSAND PARTNERS. An Autobiography, as told to Robert W. Bruére. New York: Harper 1931, xv + 217 pp., $3.00.

Two things stand out conspicuously in this book. The first is the personality of Mr. Penney, who is a man of remarkable business acumen and spiritual insight, though he insists throughout that he is only an average man.

The second noteworthy item is the novelty of the "partnership idea" on which the merchant built his business. "The J. C. Penney company is not so much a chain of stores as it is a chain of men held together by an idea." Mr. Penney attributes the success of this unique type of organization to the care with which he has selected men for responsible positions. The methods of selection are discussed throughout the book, as are also the many philanthropic activities of Mr. Penney.

Though Mr. Bruère modestly characterizes himself as a mouthpiece, he has caught the spirit of events and has interpreted them in such a way as to make a most inspiring document.

THE AUTOBIOGRAPHY OF AN ENGINEER. By William LeRoy Emmet. Albany; Fort Orange Press, 1931, xiv + 213 pp., $2.00.

This autobiography, of an engineer who began at the bottom and become one of the most productive electrical engineers of this generation, should be an inspiration to young men who aspire to careers in this field. While it recounts the invention of many new features in applied electricity, it suggests that the field is still open for men who will cultivate it industriously and studiously.

EDUCATION AS A LIFE WORK. By Riverda Harding Jordan. New York: Century, 1931, xii + 313 pp., $2.00.

This book was prepared for use in teacher-training institutions and in classes for vocational guidance, in order to show young people what opportunities there are in the field of education. Positions are described in public and private schools, universities, normal schools, and subsidiary agencies. An attempt is made to picture as accurately as possible the conditions, requirements, and rewards, and the present trends in education.

Questions and problems accompany each chapter.

JOURNALISTIC VOCATIONS. By Charles Elkins Rogers. New York: Appleton, 1931, xi + 354 pp., $2.50.

In the subtitle this book is described as "A Beginner's Guide to Editorial Work, Advertising, Circulation, Free Lance Writing, Publicity, and Related Fields." The author discusses the conditions, requirements, and rewards in the various fields, with copious citations of fact and quotations of dramatic incidents.

In order to facilitate its use as a text in courses in journalism, there are questions and exercises, a bibliography, and a glossary.

OPPORTUNITIES FOR VOCATIONAL TRAINING IN NEW YORK CITY. Compiled by the Vocational Service for Juniors, New York, 1930, xv + 95 pp.

This is the fifth edition of a directory of opportunities for vocational training available in New York City. In this revision, the occupations and occupational subjects taught are arranged alphabetically, with lists of schools offering training under each one. The schools mentioned are indexed at the end of the book. Indispensable to vocational counselors in and around New York City.

THE UNITED STATES' FOREIGN SERVICE AS A CAREER. By Edwin Schoenrich. Chestertown, Md.; Washington College Studies in Vocations, no. 2, 1930, 6 pp.

This publication is the second in a series of talks on vocations prepared for delivery in the weekly assemblies of Washington College. The pamphlet contains exactly the information wanted by one who is contemplating a career in the United States Foreign Service. It is enlivened with local color that can be furnished only by one who is experienced in the occupation.

PHILOSOPHY OF A BIOLOGIST. By Sir Leonard Hill. London: Edward Arnold, 1930, viii, 88 pp.

In this brief essay the author attempts to condense the evidence of recent physical science on the nature of the universe, largely through summary and paraphrase of the works of astronomers, physicists, biologists, with especial emphasis upon the work of the neurologists Sherrington and Pavlov. One looks in vain for some signs of reflection upon problems of method, or some theoretical integration of the scientific material which might justify the book's title as "philosophy." Hence one's surprise to be assured at the end that energy, conceived by modern science as "eternal, infinite, and unknowable," is really equivalent to the conception of God.

BEHAVIORISM. By John B. Watson. New York: Norton, 1930, 308 pp., $3.00.

A reprinting of the author's series of lectures upon the theoretical foundations of "Behaviorism," which were first published in 1925 and are here revised with additional material. All development is said to be due to "conditionings." "The behaviorist advances the view that what the psychologist has hitherto called thought is in short nothing but talking to ourselves."

COMMON ANNOYANCES: A PSYCHOLOGICAL STUDY OF EVERYDAY AVERSIONS AND IRRITATIONS. By Hulsey Cason. Princeton: Psychological Review Co., 1930, 218 pp.

The author collected an exhaustive list of things that commonly annoy people. Then a large population rated the degree of annoyance caused them by these various things. Age and sex differences in irascibility are found. The average degree of annoyance occasioned by each of the situations is shown. The last part of the monograph is devoted to a series of explanations as to why these specific situations annoy.

New Books

INDUSTRIAL EDUCATION

EDUCATION FOR BUSINESS. By Leverett Samuel Lyon. Chicago: Univ. of Chic. Press, 1931, 602 pp., $3.50.

WHAT PEOPLE WANT TO READ ABOUT: A Study of Group Interests and a Survey of Problems in Adult Reading. By Douglas Waples and Ralph Winfred Tyler. Chicago: Amer. Lib. Ass'n and Univ. of Chic. Press, 1931, 342 pp., $3.50.

MANAGEMENT AND ADMINISTRATION

FORD MEN AND METHODS. By Edwin P. Norwood. New York: Doubleday, Doran, 1931, 216 pp., $2.00.

"HOW'S BUSINESS?" By Merle Thrope. New York: Harper, 1931, 218 pp., $2.50.

INDUSTRIAL ORGANIZATION. By Harry Rubey. Boston: Ginn, 1931, 318 pp., $2.80.

MANUAL ON RESEARCH AND REPORTS. By Herman Feldman. Baltimore: Williams & Wilkins, 1931, 118 pp., $1.25.

PROBLEMS IN RETAIL MANAGEMENT. By Malcolm P. McNair and Charles I. Gragg. New York: McGraw-Hill, 1931, 741 pp., $6.00.

RATIONALIZATION OF GERMAN INDUSTRY. By National Industrial Conference Board. New York: Author, 1931, 197 pp., $3.00.

SALESMEN IN MARKETING STRATEGY. By Leverett S. Lyon. New York: Macmillan, 1931, 433 pp., $5.00.

GUIDANCE

THE WORLD AT WORK. By Wallace Walter Atwood. Boston: Ginn, 1931, 351 pp., $1.60.

VOCATIONAL INFORMATION

AIR TRANSPORT OPERATION. By Wesley L. Smith. New York: McGraw-Hill, 1931, 316 pp., $4.00.

BOOKKEEPING AND BUSINESS KNOWLEDGE. Jacob Hugh Jackson and others. Boston: Ginn, 1931, 421 pp., $1.64.

DIGGERS AND BUILDERS. By Henry Lent. New York: Macmillan, 1931, 68 pp., $2.00.

MAKERS OF CHEMISTRY. By Eric John Holmyard. New York: Oxford, 1931, 329 pp., $2.50.

THE BOOK OF ELECTRICAL WONDERS. By Ellison Hawks. New York: Dial Press, 1931, 316 pp., $3.00.

THE STORY OF PRINTED PICTURES. By Katharine Stanley-Brown. New York: Harper, 1931, 119 pp., $1.25.

THE TECHNIQUE OF COLOUR PHOTOGRAPHY. By Frank R. Newens. Boston: Amer. Photographic Pub. Co., 1931, 116 pp., $2.00.

PSYCHOLOGY

EFFECTIVE STUDY HABITS. By Charles Bird. New York: Century, 1931, 262 pp., $1.50.

EXPERIMENTAL PSYCHOLOGY. By Johannes Lindworsky. New York: Macmillan, 1931, 425 pp., $3.75.

EXPERIMENTAL SOCIAL PSYCHOLOGY. By Gardner Murphy and Lois Barclay Murphy. New York: Harper, 1931, 709 pp., $3.50.

FIELDS OF PSYCHOLOGY: A Study of Man and His Environment. By Glenn Devere Higginson. New York: Holt, 1931, 631 pp., $2.75.

ORDER OF BIRTH, PARENT-AGE AND INTELLIGENCE. By L. L. Thurstone and R. L. Jenkins. Chicago: Univ. of Chic. Press, 1931, 148 pp., $3.00.

STUDENTS' ATTITUDES: A Report of the Syracuse University Reaction Study. Daniel Katz and others. Syracuse: Craftsman Press, 1931, 436 pp., $3.50.

THE DISSATISFIED WORKER. By Vivian Ezra Fisher and Joseph V. Hanna. New York: Macmillan, 1931, 269 pp., $2.00.

THE ART OF LEARNING. By Walter Boughton Pitkin. New York: Whittlesey House, McGraw-Hill, 1931, 423 pp., $2.50.

PHILOSOPHY

THE WAY OUT OF EDUCATIONAL CONFUSION. By John Dewey. Cambridge, Mass: Harvard, 1931, 48 pp., $1.00.

SOCIOLOGY

CULTURAL EDUCATIONS AND COMMON SENSE. By David S. Snedden. New York: Macmillan, 1931, 335 pp., $2.00.

CULTURE AND EDUCATION IN AMERICA. By Harold O. Rugg. New York: Harcourt, 1931, 416 pp., $2.75.

SOCIAL WELFARE AND PROFESSIONAL EDUCATION. By Edith Abbott. Chicago, Univ. of Chic. Press, 1931, 188 pp., $2.00:

SOCIAL WORK ADMINISTRATION. By Elwood Street. New York: Harper, 1931. 487 pp., $3.00.

ECONOMICS

THE END OF REPARATIONS. By Hjalmar Schacht. New York: Cape & Smith, 1931, 248 pp., $3.00.

THE FULL-FASHIONED HOSIERY WORKER: His Changing Economic Status. By George William Taylor. Philadelphia: Univ. of Pa. Press, 1931, 247 pp., $3.00.

THE RIGHT TO WORK, OR, HOW TO STABILIZE INDUSTRY AND EMPLOYMENT. By A. M. Lorentz, Boston: Badger, 1931. 154 pp., $2.00.

Current Periodicals

PREPARED BY LINDA H. MORLEY, *Industrial Relations Counselors, Inc.*

ACCIDENT STATISTICS

Accidents in selected manufacturing industries, 1926 to 1929. *Monthly Labor Review*, May, 1931, vol. 32, p. 1033–1037.

Frequency rate for combined industries dropped to 14 per cent for the period, while the severity rate decreased 27 per cent. Tables give number of accidents and accident frequency and severity rates for specified industries, 1926 to 1929.

APPRENTICES

FREUND, C. J. (Apprentice Supervisor, Falk Corporation). Start apprentice training now. *Iron Age*, June 18, 1931, vol. 127, p. 1957–1960.

Question has always been whether to start apprentice training in busy or dull periods. Mr. Freund concludes that the period of depression is the better time, since then management has more leisure to work out a satisfactory plan, and to introduce properly the apprentices into departments to which they are assigned.

FREUND, C. J. What about apprentices these days? *Iron Age*, June 4, 1931, vol. 127, p. 1803–1805, 1928.

"Apprentice training, like all other items of plant expense, becomes a burden in hard times, But it is false economy, according to the author, to abandon the apprentice course. Interruption of apprenticeship training largely destroys its value to the learner. It discourages future enrollment in training courses and alienates the support of the public. Apprentices should be put on part time, if necessary, like the regular force, but should not be dismissed."

DISMISSAL BONUS

HAWKINS, EVERETT D. Dismissal wages. *Industrial Relations*, May, 1931, vol. 2, p. 144–146.

Describes in detail the functions and types of dismissal wages, as to their source, amount, method of payment and basis for determining the amount. Lists 18 selected companies with their financial plans to relieve workers' risks.

DISSEMINATION OF INFORMATION

FREDERICK, J. GEORGE (President, The Business Bourse). Organization charts as employee-educators. *Office Economist*, May, 1931, vol. 13, p. 3–4, 12.

Advocates special charts be distributed which would disclose to the ordinary employee the functions of the organization. In addition he would include a clear and simple statement concerning the company's history, policies, aims, ideals, principles and standards.

EMPLOYMENT

HORNING, H. L. (President, Waukesha Motor Co.). What technical men can do to assure their own employment. *Iron Age*, July 2, 1931, vol. 128, p. 6–9, 51.

Experience has been that technical men have little tendency to make sustained effort for advancement, being inclined rather to be satisfied with their pay and their positions. Believes they should be creative, and visualize what the public wants, and thus widen their knowledge and understanding of mankind.

EMPLOYMENT DEPARTMENT RECORDS

STRAIGHT, D. A. Forms that humanize personnel control. *System*, May, 1931, vol. 59, p. 377–378. (Abstract in *Management Review*, June, 1931, vol. 20, p. 178).

"Outlines some forms for personnel department work including application forms, attendance and expense forms and salary adjustment forms."

FATIGUE

SAPPINGTON, C. O. (M.D.; Director, Division of Industrial Health, National Safety Council). Tired workers are poor workers. *Factory and Industrial Management*, June, 1931, vol. 81, p. 971–972.

Frequently, unexplained accidents have been caused by employees who have whipped the physical energy of their bodies and their mental reactions past the point of usual physical and mental fatigue. They are then not capable of making mental judgments which are consistent with safety, nor are they able to co-ordinate movements of muscles with their tired minds. Considers in detail conditions which lead to chronic fatigue, which in turn causes also irritability. Suggests development of sane appreciation of the values of life, which must be attained, if mental and physical disturbances are to be controlled.

FOREMEN

THOMASON, C. C. (Head of the Department of the Social Sciences, Rochester Athenaeum and Mechanics Institute). Foreman job analysis. *Personnel*, May, 1931, vol. 8, p. 11–15.

Comprehensive list of duties of foremen, grouped under general requirements, economic responsibilities, personnel functions, and technological duties. The basic function of the foreman is to work for a quality of product of highest practical standard, at lowest cost, and complete economy of time.

HEALTH

Women sick more but live longer. *Illinois Health Messenger*, July 1, 1931, vol. 3, p. 51.

Records show that women, on an average live 2 years longer than men but rates of impairment are higher.

HOURS OF LABOR—FIVE-DAY WEEK

Returns from five-day week. *Information Service*, May 30, 1931, vol. 10, p. 4.

E. R. Squibb and Sons found that production in the five-day week amounted to 98.5 per cent of the production attained in 5½ days; that labor turnover was reduced and efficiency increased.

INCENTIVES

Cost control and wage incentives effect savings. *Iron Age*, May 21, 1931, vol. 127, p. 1657–1663, 1698.

Monarch Machine Tool Company, Sidney, Ohio, has given thorough trial to the Dyer system, a cost control system, which includes a wage incentive plan. Approximately 94 per cent of the employees are paid according to the work produced.

FLORA, CHARLES P. (Manager, Standards Dept., Hood Rubber Co.) and SUTTILL, ALBERT G. Maintenance costs less with every job on incentive. *Factory and Industrial Management*, June, 1931, vol. 81, p. 974–976.

Hood Rubber Company began work on incentives for maintenance crews in 1923. Costs were high in beginning, but recent week measured an increase of 15 per cent in average earnings of mechanics, and a savings of 27.5 per cent in cost of maintenance labor.

Solving the problem of delivery personnel. *System*, July, 1931, vol. 60, p. 35–36. (Abstract in *Management Review*, July, 1931, vol. 20, p. 215–216).

Driver for the Meyer-Powers Ice Cream Company owns the truck chassis, while the company provides the refrigerating equipment for the body. Weekly salary is in form of drawing account. Plan gives driver responsibility and trucks are operated more carefully and profitably. Also does away with a great deal of loitering.

INDUSTRIAL RELATIONS—BIBLIOGRAPHY

Leeds (England) Public Libraries. Commerical and technical library bulletins.

Series of five bulletins listing books and

some periodical and trade journal references on industrial relations, industrial psychology, industrial management, industrial health and industrial welfare. Bulletin on industrial psychology is an annotated list. Issued Nov. 1930–Mar. 1931.

LABOR DECISIONS

GARD, WAYNE (Editorial Staff, Des Moines Register and Tribune). Injunction process in labor disputes. *Current History*, Mar. 1931, vol. 33, p. 829–833.

Discussion of Senate bill 2497. Advocates of anti-injunction legislation believe the growing bitterness of organized labor toward the Federal Courts is a situation the nation can not well afford to ignore.

LENGTH OF SERVICE

FRAIN, H. LARUE. Long service and the pay envelope. *American Machinist*, Apr. 23, 1931, vol. 74, p. 645–648.

"Analysis of relation between wages and length of service in standard machine tool occupations illustrated by tabulated data on length of service by firms for operators of seven standard machine tools; average weekly earnings vary from $34 to $43."

LOANS

ROBINSON, LOUIS N. Morris plan. *American Economic Review*, June, 1931, vol. 21, p. 222–235.

Describes the plan which is a scheme of "lending money on endorsed notes at a high rate of interest with repayment by installments." In some states the Morris Plan companies are licensed under the Uniform Small Loan law. Opinion of author is that the charge is not too high for the class of business which these companies do.

LUNCH ROOMS

PAMPEL, W. J., AND WILLSON, H. E. Western Electric's well-planned restaurant serves quickly, attractively, at low cost, 3,000 meals an hour. *Factory and Industrial Management*, June, 1931, vol. 81, p. 977–979.

Description of exterior and interior of the building, including floor plans, types of material used for tables and chairs, kitchen equipment, etc.

MEDICAL SERVICE

Measuring the value of plant medical service. *Service Letter on Industrial Relations*, New Series, no. 78, June 30, 1931 p. 7–8.

Results obtained through the work of the medical department in one company show substantial savings for the company and also for the employees. Gives specific services rendered by doctors and nurses, and total estimated savings for company and employees.

NATIONAL ECONOMIC COUNCILS—BIBLIOGRAPHY

THOMPSON, LAURA A. (Librarian, United States Department of Labor) National economic councils: a list of references. *Monthly Labor Review*, May, 1931 vol. 32, p. 1249–1258.

Annotated bibliography consisting of list of general material on economic planning and representation, and grouped by country, books, pamphlets and periodicals which give plans for economic councils.

PENSIONS

FIRTH, N. C. Why havn't you a pension plan? *System*, May, 1931, vol. 59, p. 362–364.

"Discusses how to decide what a pension plan is to be to you, your company and its employees. Pension plan should be thought of as a management tool that is being used more and more by companies to remove justly, without embarrassment, workers rendered inefficient by old age; to develop better employer-employee relations and to aid men in providing for old age during their best years."

Insured retirement program. *Industrial Relations*, June, 1931, vol. 2, p. 208–212.

Details of two of the more recent plans, in which assurance of safety and security is given the employees of the St. Louis Union Trust Company, and the Presbyterian Hospital in the city of New York.

Old-age pensions paid by labor organizations, 1930. *Monthly Labor Review*, May, 1931, vol. 32, p. 1065.

In 1930, 11 of the 12 organizations which have old-age pension systems paid out $3,403,180 to 13,049 pensioners. Number of pensioners in labor organizations has nearly doubled since 1927.

PULLEN, PAUL P. (Chicago Title & Trust Co.) Trust Company operation of industrial pension reserves. *Industrial Relation* June, 1931, vol. 2, p. 190–192.

"As the trust companies do it—with special reference to the methods and forms employed by the Chicago Title and Trust Company."

PERSONNEL MANAGEMENT IN DEPRESSION PERIODS

COWDRICK, EDWARD S. Labor management in depression. *Nation's Business*, June, 1931, vol. 19, p. 32–34, 138.

"In the depression of 1921 many concerns ceased industrial relations activities to cut costs. In the depression of 1929 many companies found these activities most useful."

HOOK, JAMES W. (President, The Geometric Tool Company, New Haven, Conn.; Chairman, State Emergency Committee on Employment). Preparing for the next depression. *Service Letter on Industrial Relations*, New Series, no. 77, May 30, 1931, p. 1–3.

This company keeps weekly record for each employee to show the effect depression has had and is having on time worked and wages received. At end of each nine weeks period average is compared with average full time period. Information is also obtained for age, number of dependents, date of employment, etc. for each employee. These records form the base from which wages, working time, etc. are calculated. Work has been spread since Feb. 1930 to keep all workmen employed.

PHYSICAL EXAMINATIONS

DAVIS, W. LYNN. (Industrial Manager, A. E. Staley Manufacturing Company). Lower Labor turnover, fewer accidents, better work, these are possible if you examine before you hire. *Factory and Industrial Management*, June, 1931, vol. 81, p. 987–989.

Require a complete physical examination, including blood tests, for all applicants for jobs in the A. E. Staley, Manufacturing Company. All old employees were also given examinations. Results prove that men sound and clean physically are of great asset to the company.

RATING

PROBST, J. B. (Chief Civil Service Examiner, City of St. Paul, Minnesota). Starting from scratch in employee service ratings. *Personnel*, May, 1931, vol. 8, p. 21–24.

Describes Probst employee rating plan, which consists of a service report and a machine for evaluating the report. Report itself contains about 100 descriptive items of outstanding traits, not averages. Usually 3 supervisory officers check the items which describe the employee, and these are then evaluated by means of a scoring device. Value of plan is that it points out to employee his good as well as bad qualities and provides him with a "clear, definite trait-picture of himself."

SAFETY

Pennsylvania Safety Conference. (Proceedings). *Labor and Industry*, Apr. 1931, vol. 18, p. 1–103.

Papers on Accidents, by H. W. Heinrich; Psychology of safety, by J. O. Keller; Industrial safety, by F. J. Lanahan; Safety, by J. W. Rawle; Achieving success in the field of industrial safety, by D. D. Fennell; and discussions of unusual safety records by representatives of various industries, are included in this pamphlet.

TRAINING FOREMEN

HOOK, CHARLES R. (President, American Rolling Mill Company). Training supervisors in management. *Executives Service Bulletin*, June, 1931, vol. 9, p. 3–4.

"Describes the objectives of the American Rolling Mill program and the means taken to acquaint the foreman-managers

with their responsibilities. He points out that the time which management devotes to such plans brings definite returns in greater production and better quality of product."

TURNOVER

Standard procedure for compiling turnover statistics. *Monthly Labor Review*, June, 1931, vol. 32, p. 1392–1394.

A detailed description of the procedure followed by the U. S. Bureau of Labor Statistics in collecting and publishing monthly figures of turnover rates for about 3,500 manufacturing establishments. Article gives definitions adopted in handling labor turnover statistics, which include quits, layoffs, discharges, accessions and separations.

UNEMPLOYMENT INSURANCE

FOLSOM, M. B. (Assistant Treasurer, Eastman Kodak Co.) Rochester unemployment benefit plan. *Service Letter on Industrial Relations*, New Series, no. 76 Apr. 30, 1931, p. 1–5.

Outline of co-operative Unemployment Reserve Fund plan, with detailed explanation of certain features. Group includes 14 companies, employing normally 26,000 persons.

UNEMPLOYMENT INSURANCE—BIBLIOGRAPHY

Unemployment insurance and prevention: a select critical bibliography. *American Labor Legislation Review*, June, 1931, vol. 21, p. 265–270.

Preference given to secondary sources, but a few primary sources and some bibliographies are listed. Classified under American experience and legislative proposals; British unemployment insurance; German unemployment insurance; Unemployment prevention, and Bibliographies. Annotated list.

UNION MANAGEMENT CO-OPERATION

STOCKTON, FRANK T. (University of Kansas). Productive co-operation in the Moulders Union. *American Economic Review*, June, 1931, vol. 21, p. 260–274.

Between 1847 and 1906 there were established numerous co-operative foundries. Effort was made to secure federal charter in 1873 in order to give better protection to the funds, but Congress refused to pass the bill. Co-operative movement failed for several reasons: organizations were hastily formed, generally as the result of strikes; the number of associators was usually few, with little or no capital and markets for sale of products were usually small; at the present time moulders pursue strictly trade union policies.

UNITED STATES—ECONOMIC CONDITIONS

BAKER, BENJAMIN. Wage rates, "The American standard of living," and business recovery. *Annalist*, May 29, 1931, vol. 37, p. 971–972.

Suggests the temporary lowering of wage rates, with other costs of production, with the understanding that the rates would rise with increased business, as the best policy for labor organizations to follow. Believes "thing to be desired now is an adjustment which will restore a reasonable degree of prosperity for the country in general."

FRANK, GLENN. (President, University of Wisconsin). Business defeatism and economic recovery. *Management Review*, June, 1931, vol. 20, p. 163–172.

Believes "the key problem of the United States is that of a wise and business-like distribution of social buying power, through farsighted business, industrial and financial leadership." Thinks our present economic state is the result of a planless past.

WAGES

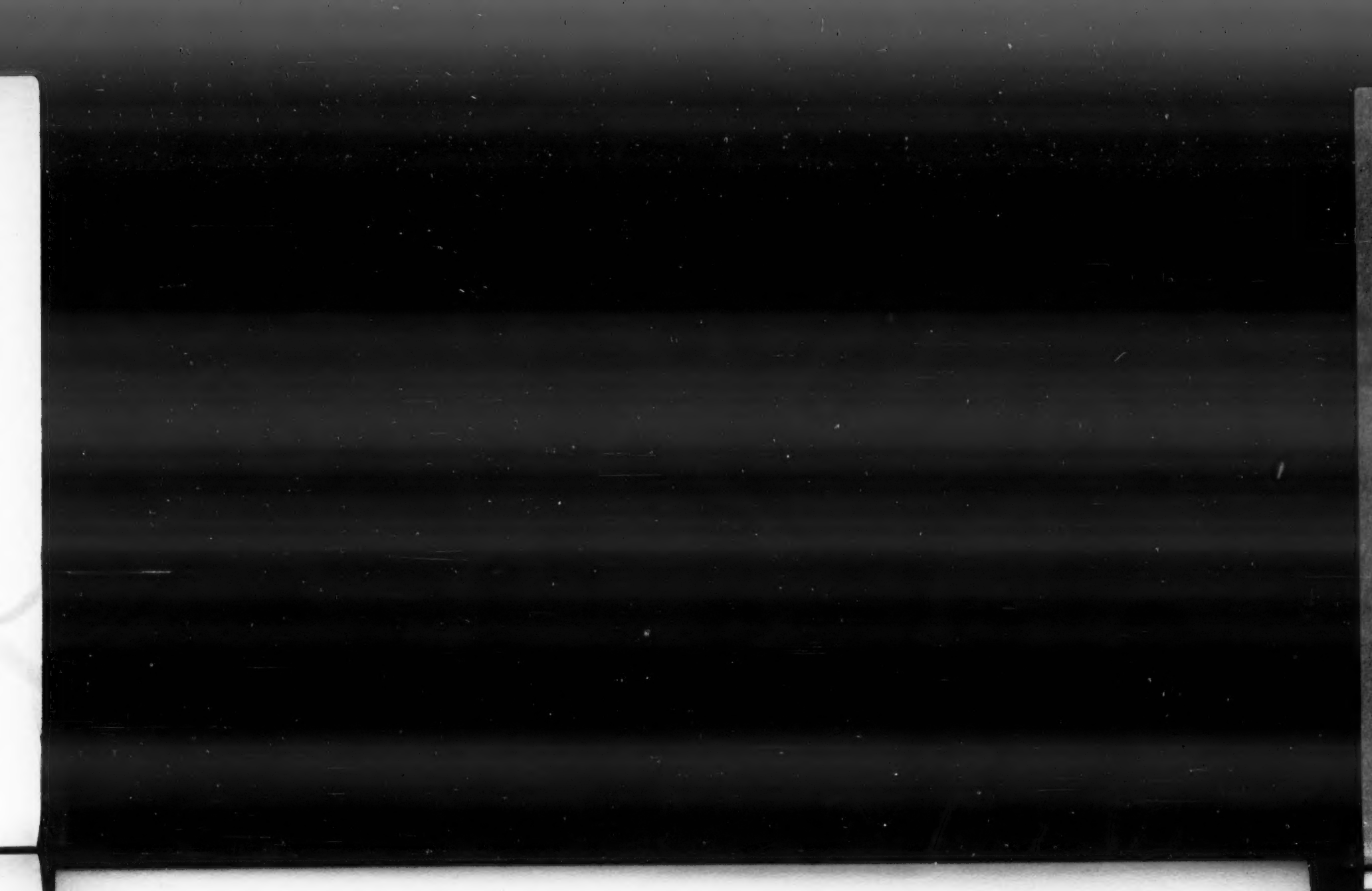
DICKINSON, ROY. Wage cuts and wild words. *Printers' Ink*, May 28, 1931, vol. 154, p. 25–26, 28, 33.

Compares wage discussions during depression of 1921, with those today. Believes only way to adjust the curves of the business cycles to prevent periods when wage cutting and work spreading becomes almost a necessity for many employers,

is to make some adjustment on "the way to the mountain top rather than in the valleys."

GATES, ERRETT. (Casualty Department, Armour and Company). Wage assignments. *Personnel*, May, 1931, vol. 8, p. 15–21.

Problem of garnishment or assignment of wages discussed from view point of Armour and Company. Gives form of contract signed by employees in which they agree not to assign wages without consent of the company.

Work and Wages. *Economist*, June 20, 1931, vol. 112, p. 1314–1316.

Discussion of the view initiated by M. Jacques Rueff, that a correlation exists between curve of unemployment and that of a ratio of wages to wholesale prices. Includes also memorandum by Dr. F. C. Benham on wages, prices and unemployment, in which he traces the connection between wage rates of particular industries divided by prices of products of those industries, and unemployment in those industries. Believes what is required is "more flexibility in wage rates, working conditions and methods of production."